Voltage Drop Calculation/ Sheath Temperature Calculation

Voltage Drop Calculations

BREAKDOWN STRENGTH

300 volt cables·····2500 volts RMS
300 volt cables·····5000 volts RMS

Breakdown strength remains relatively constant up to 1000℃, beyond this point it declines rapidly.

Impulse Surge Voltage (1.5×40 wave):
300 volt cables up to and including 10AWG·····600 volts
600 volt cables·····1000 volts

1.5×40 wave is an impulse requiring 1.5 micosecondss reach crest voltage and 40 micro seconds to decay to not less than 50% of crest voltage. These values are based in actual tests with the results averaged and therefore should only be taken as approxiamate.

FACTORY TEST VOLTAGE

R.M.S Voltage
300 volt cable·····1600 volts RMS
600 volt calbe·····2200 volts RMS
250-500 kcmil cables·····2500 volts RMS

VOLTAGE DROP

To calculate voltage drop on a single phase circuit, the following formula should be used with the appropriate factor ‘A’ from Table S. On three phase circuits, multiply the single phase answer obtained by 0.87, to obtain voltage drop between phases. These calculations are simplified for easy to use, and give approximate results which are generally conservative.

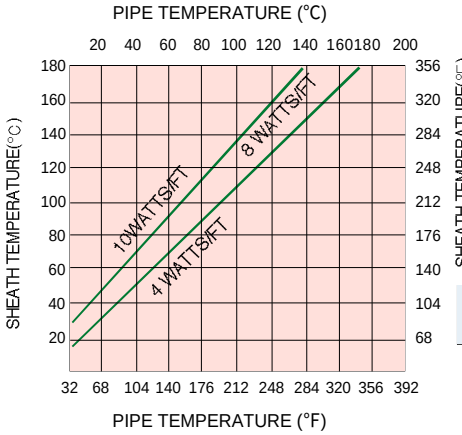
$$\textbf{VOLTAGE DROP} = \frac{(\text{RUN LENGTH}) \times (\text{CIRCUIT CURRENT}) \times (\text{TEMR CONST}) \times (\text{FACTOR”A”})}{1000}$$

$$\textbf{VOLTAGE DROP} = \frac{\text{VOLTAGE DROP} \times 100\%}{\text{CIRCUIT VOLTAGE}}$$

These calculations are reasonably accurate when single phase circuts and three phase circuts conductors configured as recommended by **Korea EHT**.

TEMPERATURE CONSTANT		
	Cable at full rated current	1.00
	Cable at 3/4 rated current	0.95
	Cable at 1/2 rated current	0.91
	Cable at 1/4 rated current	0.88

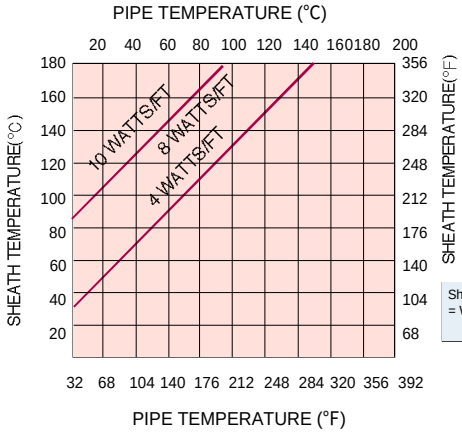
Sheath Temperature Calculation



Graph No.1

Sheath Temperature vs. Pipe Temperature Heating cable Fastened to pipe with aluminum foil tape

Sheath Temperature(°F) = Watts/Ft.° ×4.636 + Pipe maintain temperature



Graph No.2

Sheath Temperature vs. Pipe Temperature for heatingsith Strapped directly to the pipe

Sheath Temperature(°F) = Watts/Ft.° ×15.466 + Pipe maintain temperature