Reactance / Impedance

Reactance

Conductor area(mm²)	1.5	2.5	4	6	10	25	35	50	70	95	120	150	185	240	300
Rating factors (Ω /km)	0.135	0.125	0.117	0.111	0.103	0.098	0.097	0.094	0.091	0.090	0.088	0.088	0.088	0.088	0.087

The reactance of a cable operating in AC system depends on many factors, including, in particular, the axial spacing between conductors and proximity and magnetic properties of adjacent steelwork. The formar is known for multicore cable, but may vary for single core cables depending upon the spacing between them and their disposition when installed.

Reactances of cables in certain dispositions remote from steelwork are calculable and are shown. The tabulated values are for cables with circular conductors. The value for a sectorshaped conductor should be taken as 90% of the tabulated value. The value of reactance so calculated is for a supply frequency of 60Hz. For any other frequency, a correction should be made in direct proportion to the frequency.

For example at 50Hz, the reactance is 0.83 times that at 60Hz. Induction for 2-and 3- conductor cables is given by the formula:

$L = 0.2 \times [\ln (2a/b) + 0.25] \times 10^{-6}$

L = Inductance in H/m and phase

a = Axial space between conductor

d = Conductor diameter in mm

Reactance for 2-and 3-conductor cables is given by the formula:

$X = 2 \times \pi \times f \times L \times l$

X = Reactance in ohm per phase

f = Frequency in Hz

L = Inductance in H/m and phase

l = Conductor length in meter

Impedance

Conductor area (mm²)	1.5	2.5	4	6	10	16	25	35	50	70	95	120	150	185	240	300

Rating factors (Ω /km)	15.557	9.641	5.994	3.967	2.348	1.482	0.941	0.681	0.507	0.356	0.265	0.215	0.183	0.155	0.131	0.116

Impedance for 2, 3 & 4 conductor cables is given by the formula:

$$z = \sqrt{(R^2 + X^2}$$

R = Resistance at operating temp. in ohm per phase

X = Reactance in ohm per phase