

EXAMPLES OF CALCULATION OF THREE-PHASE A.C. CIRCUITS

ITEMS.	EXAMPLE No.								
	1	2	3	4	5	6	7	8	9
Given—E.M.F. delivered	660	5000	440	10000	8000	2125	70000	21600	45000
K.W. delivered (real power)	190	600	18	2500	350	75	16000	1200	20000
Power factor (cos φ)	90	70	75	80	85	90	70	80	95
Frequency	60	60	60	40	40	40	25	25	25
Length of line one way (miles)	6600	74	2600	22½	8	8000	80	18	60
Length of line one way (feet)									
Calculated—Volts per mile	528	690	800	445	1000	1400	875	1200	750
K.W. per mile	237	82.8	32.8	111	43.75	113.8	200	66.7	333.3
Ohmic loss in line allowed (?) (volts or watts)	13.5 15	8 11.4	7.5 10	20 25	6.8 8	6 8.00	10 14.3	7.2 9	11.4 12
From diagram 1. Lbs. copper per K.W. delivered	82.1	105	76	88	47	26.5	51.5	33.7	44.5
From diagram 2. Size of wire to be used	2xNo. 00000 18 in.	No. 0000 24 in.	No. 3 12 in.	No. 0000 24 in.	No. 3 12 in.	No. 2 12 in.	No. 0000 36 in.	No. 3 18 in.	2xNo. 000 24 in.
Spacing assumed for this size of wire									
From Table I.—Ratio reactance resistance	2.15	2.30	0.57	1.53	0.38	0.47	1.04	0.26	0.78
From Table II.—Drop factor	1.95	2.37	1.13	1.72	1.07	1.13	1.44	1.03	1.20
Total drop in % of delivered e.m.f.	26.3	18.96	8.48	34.4	7.28	6.78	14.4	7.42	13.68
E.M.F. impressed at gen. end of line	833	5948	477	13440	8582	2269	80080	23202	51156