Equivalent T-Networks for Equipment

46, 62, 75, 91, 93 TYPE REPEATING COILS

Impedance of T - Network Arms

Type Coil	Imp. Ratio Line:Drop	Side to Which Network* Is Referred	Network Arm	200 Cycles	300 Cycles	600 Cycles	1000 Cycles	1600 Cycles
91A, 46A	1:1	High or Low	a = b = c = c =	46 +j 8 2850 +j 7780 8090 ⌊72.3	46 +j 11 3420 +j 11,600 12,100 ⌊73.6	46 +j 23 7600 +j 26,600 27,900 ⌊73.9	48 +j 38 86,200 +j 63,200 86,000 ⌊40.9	46 +j 60 21,600 -j 67,400 74,400 ⌈64.9
93A, 75A	1:1	High or Low	a = b = c = c =	47 +j 10 1400 +j 6050 6700 ⌊77.0	47 +j 15 3070 +j 8820 9890 ⌊76.2	47 +j 30 8510 +j 18,200 19,100 ⌊73.2	47 +j 60 14,800 +j 37,200 40,000 ⌊68.7	47 +j 80 136,400 +j 65,000 151,200 ⌊25.2
93B, 75B	1:1.62	High	a = b = c = c =	44 +j 10 1400 +j 6600 6790 ⌊77.6	44 +j 15 2270 +j 9820 9890 ⌊76.2	44 +j 30 8510 +j 18,300 19,380 ⌊73.2	44 +j 60 14,800 +j 37,200 40,000 ⌊68.7	44 +j 80 128,400 +j 65,000 151,200 ⌊21.2
93C, 75C	1.62:1	Low	a = b = c = c =	37 +j 6 940 +j 4140 4250 ⌊77.2	37 +j 9 1400 +j 6080 6200 ⌊76.1	37 +j 19 3740 +j 13,000 13,600 ⌊74.0	37 +j 31 27,600 +j 33,200 45,100 ⌊50.3	37 +j 50 13,000 -j 33,600 36,000 ⌈70.6
93D, 75D	1:2.66	High	a = b = c = c =	46 +j 10 1480 +j 6800 6960 ⌊77.6	46 +j 15 2230 +j 9200 9470 ⌊76.4	46 +j 30 5050 +j 17,500 18,200 ⌊74.0	46 +j 60 10,700 +j 33,600 34,300 ⌊71.8	46 +j 80 38,200 +j 78,500 85,200 ⌊62.6
93E, 75E	2.66:1	Low	a = b = c = c =	18 +j 3 860 +j 2520 2590 ⌊77.4	18 +j 5 950 +j 3610 3730 ⌊75.4	18 +j 9 2050 +j 7980 8200 ⌊74.0	18 +j 16 14,400 +j 19,700 25,700 ⌊60.2	18 +j 25 7860 -j 20,700 22,100 ⌈69.2
93F, 75F	1.62:1	Low	a = b = c = c =	40 +j 10 1970 +j 6930 7080 ⌊77.3	40 +j 15 2780 +j 10,170 10,540 ⌊74.8	40 +j 30 12,780 +j 26,000 29,000 ⌊63.9	40 +j 60 87,200 -j 54,500 79,300 ⌈43.6	40 +j 80 2800 -j 20,700 20,880 ⌈82.4
93G, 75G	2.66:1	Low	a = b = c = c =	44 +j 6 1380 +j 5760 5900 ⌊76.7	44 +j 8 1900 +j 8840 8870 ⌊76.0	44 +j 17 8850 +j 20,000 24,000 ⌊70.4	44 +j 28 28,700 -j 65,400 69,400 ⌈63.6	44 +j 45 1250 -j 16,000 16,000 ⌈85.5
93H	1.26:1	Low	a = b = c = c =	55 +j 7 1810 +j 6770 6940 ⌊77.4	55 +j 10 2830 +j 9700 10,070 ⌊77.8	55 +j 21 8280 +j 21,700 23,400 ⌊69.3	55 +j 35 75,800 +j 61,600 90,100 ⌊34.9	55 +j 55 9480 -j 40,350 41,400 ⌈76.8
93J	2.28:1	Low	a = b = c = c =	46 +j 6 1380 +j 5760 5980 ⌊76.7	46 +j 9 1880 +j 8540 8870 ⌊76.0	46 +j 18 8080 +j 25,000 26,000 ⌊70.4	46 +j 28 28,700 -j 68,400 63,600 ⌈63.6	46 +j 48 1250 -j 16,000 16,000 ⌈85.5
46A 62A	1:1	High or Low	a = b = c = c =	47 +j 10 100 +j 2000 2000 ⌊87.2	47 +j 15 200 +j 2880 2870 ⌊85.6	47 +j 30 400 +j 8070 8080 ⌊84.5	47 +j 60 970 +j 8990 9040 ⌊83.8	47 +j 80 2190 +j 17,050 17,200 ⌊82.7
62B, 62B	1:1.62	High	a = b = c = c =	44 +j 10 100 +j 2000 2020 ⌊87.2	44 +j 15 200 +j 2880 2870 ⌊86.0	44 +j 30 400 +j 8070 8080 ⌊84.5	44 +j 60 970 +j 8990 9040 ⌊83.8	44 +j 80 2190 +j 17,050 17,200 ⌊82.7
62C	1.62:1	Low	a = b = c = c =	37 +j 6 60 +j 1270 1270 ⌊87.3	37 +j 9 125 +j 1890 1900 ⌊86.0	37 +j 19 270 +j 3280 3290 ⌊85.3	37 +j 31 780 +j 6230 6280 ⌊83.1	37 +j 50 2050 +j 15,600 15,900 ⌊75.0
62D	2.66:1	Low	a = b = c = c =	18 +j 3 37 +j 761 762 ⌊87.1	18 +j 5 80 +j 1080 1080 ⌊85.6	18 +j 9 160 +j 1980 1990 ⌊85.4	18 +j 16 480 +j 3800 3840 ⌊83.1	18 +j 25 1900 +j 9570 9760 ⌊78.8
62E	1:1.28	High	a = b = c = c =	48 +j 10 100 +j 2020 2030 ⌊87.1	48 +j 15 210 +j 2880 2880 ⌊85.6	48 +j 30 820 +j 8190 8200 ⌊84.3	48 +j 50 1120 +j 9630 9700 ⌊83.4	48 +j 80 3480 +j 21,400 21,600 ⌊80.8
62F	1:2.34	High	a = b = c = c =	42 +j 10 100 +j 2020 2030 ⌊87.1	42 +j 15 210 +j 2880 2880 ⌊85.6	42 +j 30 820 +j 8190 8200 ⌊84.3	42 +j 50 1120 +j 9630 9700 ⌊83.4	42 +j 80 3480 +j 21,400 21,600 ⌊80.8

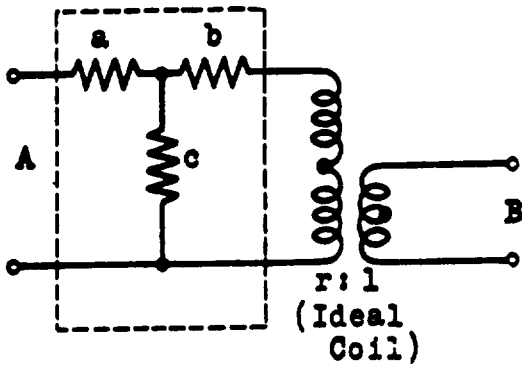
Type Coil	2000 Cycles	2200 Cycles	2400 Cycles	2800 Cycles	3000 Cycles
91A, 46A	46 +j 78 7770 -j 40,380 41,140 ⌈78.8	46 +j 88 4990 -j 33,580 33,920 ⌈81.6	46 +j 98 3880 -j 38,680 39,040 ⌈83.4	46 +j 100 1880 -j 21,830 21,800 ⌈85.8	46 +j 113 1340 -j 29,880 30,800 ⌈85.1
93A, 75A	47 +j 100 96,400 -j 109,600 146,200 ⌈48.6	47 +j 116 41,080 -j 91,400 100,200 ⌈65.9	47 +j 120 31,600 -j 78,580 78,900 ⌈73.8	47 +j 145 7370 -j 48,300 48,900 ⌈81.6	47 +j 181 5680 -j 44,100 44,500 ⌈82.7
93B, 75B	44 +j 100 95,400 -j 109,600 146,300 ⌈48.6	44 +j 110 41,000 -j 91,400 100,200 ⌈65.9	44 +j 120 21,600 -j 72,800 75,900 ⌈73.8	44 +j 145 7170 -j 48,300 48,900 ⌈81.6	44 +j 181 5680 -j 44,100 44,500 ⌈82.7
93C, 75C	37 +j 65 8,000 -j 20,300 20,400 ⌈81.8	37 +j 69 1900 -j 14,800 14,900 ⌈83.3	37 +j 78 1280 -j 14,480 14,540 ⌈84.9	37 +j 91 880 -j 10,880 10,920 ⌈85.3	37 +j 94 800 -j 10,480 10,400 ⌈87.2
93D, 75D	46 +j 100 137,900 +j 108,000 175,200 ⌊38.1	46 +j 110 240,200 +j 32,900 242,800 ⌊7.8	46 +j 120 201,600 -j 138,000 261,900 ⌈35.7	46 +j 145 40,080 -j 108,200 116,600 ⌈69.3	46 +j 181 31,880 -j 99,900 104,800 ⌈72.5
93E, 75E	18 +j 31 1940 -j 12,220 12,470 ⌈81.1	18 +j 35 1210 -j 10,270 10,340 ⌈83.3	18 +j 38 610 -j 8850 8880 ⌈86.7	18 +j 44 380 -j 6680 6680 ⌈86.7	18 +j 47 310 -j 6240 6250 ⌈87.2
93F, 75F	40 +j 100 980 -j 14,280 14,300 ⌈86.3	40 +j 110 640 -j 12,880 12,940 ⌈87.1	40 +j 120 400 -j 11,140 11,150 ⌈87.9	40 +j 145 280 -j 8790 8790 ⌈88.3	40 +j 181 280 -j 8440 8440 ⌈88.0
93G, 75G	44 +j 55 480 -j 10,450 10,970 ⌈87.3	44 +j 60 340 -j 9600 9870 ⌈87.7	44 +j 68 250 -j 8830 8820 ⌈88.3	44 +j 85 130 -j 6720 6710 ⌈88.7	44 +j 88 110 -j 6400 6400 ⌈89.0
93H	55 +j 65 2800 -j 25,200 25,200 ⌈83.5	55 +j 70 1880 -j 21,400 21,500 ⌈85.6	55 +j 85 1280 -j 16,600 16,700 ⌈85.6	55 +j 100 610 -j 14,200 14,200 ⌈87.5	55 +j 104 580 -j 12,640 12,600 ⌈87.4
93J	46 +j 60 480 -j 10,950 10,970 ⌈87.3	46 +j 65 340 -j 9860 9870 ⌈87.7	46 +j 78 250 -j 8810 8820 ⌈88.3	46 +j 88 125 -j 6730 6710 ⌈88.7	46 +j 90 110 -j 6400 6400 ⌈89.0
46A 62A	47 +j 100 4160 +j 25,670 26,000 ⌊80.8	47 +j 110 8040 +j 22,000 23,500 ⌊70.6	47 +j 120 8880 +j 40,700 41,700 ⌊77.6	47 +j 145 38,100 +j 87,000 95,100 ⌊66.0	47 +j 181 70,200 +j 110,000 130,500 ⌊57.4
62B, 62B	44 +j 100 4160 +j 25,670 26,000 ⌊80.8	44 +j 110 8040 +j 22,000 23,500 ⌊70.6	44 +j 120 8880 +j 40,700 41,700 ⌊77.6	44 +j 145 38,100 +j 87,000 95,100 ⌊66.0	44 +j 181 70,200 +j 110,000 130,500 ⌊57.4
62C	37 +j 65 17,080 +j 38,300 41,800 ⌊66.1	37 +j 69 68,860 +j 45,000 96,800 ⌊30.4	37 +j 78 40,800 -j 60,100 77,900 ⌈56.5	37 +j 91 2870 -j 20,880 22,040 ⌈81.6	37 +j 94 2720 -j 19,880 20,100 ⌈82.2
62D	18 +j 31 10,880 +j 25,000 28,070 ⌊66.2	18 +j 35 68,780 +j 38,880 79,000 ⌊30.4	18 +j 38 29,000 -j 38,500 48,200 ⌈51.4	18 +j 44 2380 -j 12,880 13,880 ⌈80.1	18 +j 47 1620 -j 12,140 12,200 ⌈82.4
62E	48 +j 100 10,900 +j 40,880 42,000 ⌊75.0	48 +j 110 35,480 +j 62,900 67,900 ⌊60.0	48 +j 120 98,100 +j 97,000 138,900 ⌊48.6	48 +j 145 28,900 -j 70,000 75,700 ⌈71.8	48 +j 181 14,800 -j 88,100 80,000 ⌈78.7
62F	42 +j 100 10,900 +j 40,800 42,000 ⌊75.0	42 +j 110 35,480 +j 62,900 67,900 ⌊60.0	42 +j 120 98,100 +j 97,000 138,900 ⌊48.6	42 +j 145 28,900 -j 70,000 75,700 ⌈71.8	42 +j 181 14,800 -j 88,100 80,000 ⌈78.7

Notes: These 1:1 T-networks are used in conjunction with an ideal repeating coil having the same impedance ratio as the actual repeating coil. The method of using the networks and of taking account of any impedance connected at the mid-point of coil windings is shown on drawing 616-300

The network arm values are based on measuring voltages of 3 volts across the drop windings. The resistance of the a and b arms is subject to ± 10% manufacturing variation; the inductance in the a and b arms and all elements entering into the c arm values (a capacitance in parallel with a resistance and an inductance in series) are subject to ± 20% manufacturing variation.

Method of Using 1: 1 T-Networks of Repeating Coils For Impedance Computations

Networks Referred to High Impedance Side



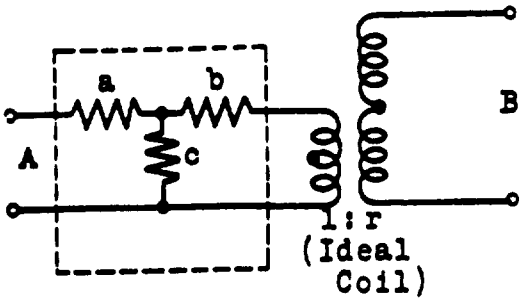
For Impedance at A: Multiply the impedance connected at B by r (the impedance ratio of the coil involved, greater than 1) and combine the resultant with the T-Network.

For Impedance at B: Combine the impedance connected at A with the T-Network and divide the resultant by r.

Note: The T-Network assumes nothing to be connected at the mid-point of the repeating coil windings. If an impedance z is connected at the mid-point of the:

1. High impedance winding, add z (vectorially) in series with arm a.
2. Low impedance winding, add z (vectorially) in series with the impedance connected at B or with that computed at B.

Networks Referred to Low Impedance Side



For Impedance at A: Divide the impedance connected at B by r (the impedance ratio of the coil involved, greater than 1) and combine the resultant with the T-Network.

For Impedance at B: Combine the impedance connected at A with the T-Network and multiply the resultant by r.

Note: The T-Network assumes nothing to be connected at the mid-point of the repeating coil windings. If an impedance z is connected at the mid-point of the:

1. High impedance winding, add z (vectorially) in series with the impedance connected at B, or with that computed at B.
2. Low impedance winding, add z (vectorially) in series with arm a.