

Table(A3) 2 winding and 3winding Transformerdata

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Study Case: 2-Winding Transformer

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SN: 12345678

Revision: Base

Config.: 2-Winding Transformer

2-Winding Transformer Input Data

Transformer ID	Rating		Z Variation			% Tap Setting Adjusted			Phase Shift				
	MVA	Prim.	Sec.	% Z	X/R	+ 5%	- 5%	% Tol.	Prim.	Sec.	% Z	Type	Angle
GAD T2	75.000	215.000	33.000	11.92	34.10	0	0	0	0	0	11.9200	Std Pos.	Sea. 0.000
GAR T1	50.000	225.000	10.500	13.79	29.50	0	0	0	0	0	13.7900	Std Pos.	Sea. 0.000
GAR T2	50.000	225.000	10.500	13.79	29.50	0	0	0	0	0	13.7900	Std Pos.	Sea. 0.000
GAR T3	50.000	225.000	10.500	13.79	29.50	0	0	0	0	0	13.7900	Std Pos.	Sea. 0.000
GAR T4	50.000	230.000	11.000	13.60	34.10	0	0	0	0	0	13.6000	Std Pos.	Sea. 0.000
GAR T5	50.000	230.000	11.000	13.79	29.50	0	0	0	0	0	13.7900	Std Pos.	Sea. 0.000
GAR T6	50.000	230.000	11.000	13.79	29.50	0	0	0	0	0	13.7900	Std Pos.	Sea. 0.000
GART8	50.000	230.000	11.000	13.79	29.50	0	0	0	0	0	13.7900	Std Pos.	Sea. 0.000
GAR T9	50.000	230.000	11.000	13.79	29.50	0	0	0	0	0	13.7900	Std Pos.	Sea. 0.000
GAR T10	50.000	230.000	11.000	13.79	29.50	0	0	0	0	0	13.7900	Std Pos.	Sea. 0.000
GAR T11	50.000	230.000	10.500	13.79	29.50	0	0	0	0	0	13.7900	Std Pos.	Sea. 0.000
GAR T12	50.000	230.000	10.500	13.79	29.50	0	0	0	0	0	13.7900	Std Pos.	Sea. 0.000
GAR T13	50.000	230.000	10.500	13.79	29.50	0	0	0	0	0	13.7900	Std Pos.	Sea. 0.000
GAR T14	70.000	230.000	11.000	15.00	29.50	0	0	0	-8.700	0	15.0000	Std Pos.	Sea. 0.000
GAR T15	70.000	230.000	11.000	15.00	29.50	0	0	0	-8.700	0	15.0000	Std Pos.	Sea. 0.000
IBA1	150.000	220.000	215.000	0.20	42.00	0	0	0	0	-2.270	0.2000	Std Pos.	Sea. 0.000
IBA2	150.000	220.000	215.000	0.20	42.00	0	0	0	0	-2.270	0.2000	Std Pos.	Sea. 0.000
IBA3	150.000	220.000	215.000	0.20	42.00	0	0	0	0	-2.270	0.2000	Std Pos.	Sea. 0.000
JAS1	150.000	115.000	110.000	0.20	42.00	0	0	0	0	0	0.2000	Std Pos.	Sea. 0.000
JAS2	150.000	115.000	110.000	0.20	42.00	0	0	0	0	0	0.2000	Std Pos.	Sea. 0.000
JAS3	150.000	115.000	110.000	0.20	42.00	0	0	0	0	0	0.2000	Std Pos.	Sea. 0.000
Khnt1	41.250	110.000	11.000	12.20	29.50	0	0	0	0	0	12.2000	Std Pos.	Sea. 0.000
KHN T2	41.250	110.000	11.000	12.20	29.50	0	0	0	0	0	12.2000	Std Pos.	Sea. 0.000
Khnt3	75.000	118.700	11.000	11.92	34.10	0	0	0	-8.992	0	11.9200	Std Pos.	Sea. 0.000
Khnt4	75.000	118.700	11.000	11.92	34.10	0	0	0	-8.992	0	11.9200	Std Pos.	Sea. 0.000
Khnt05	150.000	115.000	13.800	13.00	42.00	0	0	0	-2.503	0	13.0000	Std Pos.	Sea. 0.000
KHNT6	150.000	115.000	13.800	13.00	42.00	0	0	0	-2.503	0	13.0000	Std Pos.	Sea. 0.000
KLX4	100.000	220.000	215.000	0.20	42.00	0	0	0	0	-2.270	0.2000	Std Pos.	Sea. 0.000
KLX6	100.000	220.000	215.000	0.20	42.00	0	0	0	0	-2.270	0.2000	Std Pos.	Sea. 0.000
KLX8	100.000	220.000	215.000	0.20	42.00	0	0	0	0	-2.270	0.2000	Std Pos.	Sea. 0.000
KUK TR	90.000	110.000	33.000	9.30	34.10	0	0	0	0	0	9.3000	Std Pos.	Sea. 0.000
MWP T6,7	150.000	500.000	220.000	10.80	15.00	0	0	0	0.625	-4.550	10.8000	Std Pos.	Sea. 0.000

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Study Case: 3-Winding Transformer

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 Revision: Base
 Config.: 3-Winding

Transformer ID	Connected Buses ("*" LTC Side)		Transformer Load Tap Changer Setting					
	Primary Bus ID	Secondary Bus ID	% Tap	% Tap	% Step	Regulated Bus ID	% V	kV

3-Winding Transformer Input Data

Transformer ID	Rating		Tap %	Impedance				Z Variation		Phase Shift		
	Winding	MVA		kV	% Z	X/R	MVA _B	% Tol.	+ 5%	- 5%	Type	Angle
ATB T1.2	Primary	200.000	220.000	-3.73	Z _{ps} = 14.48	15.00	200.000	0	0	0		
	Secondary	200.000	33.000	0	Z _{pt} = 23.49	15.00	200.000	0			Std Pos.	0.000
	Tertiary	80.000	11.000	0	Z _{st} = 7.43	15.00	200.000	0			Std Pos.	0.000
ATB T3	Primary	300.000	500.000	0	Z _{ps} = 16.80	15.00	300.000	0	0	0		
	Secondary	300.000	220.000	0	Z _{pt} = 42.80	15.00	300.000	0			Std Pos.	0.000
	Tertiary	75.000	33.000	0	Z _{st} = 24.32	15.00	300.000	0			Std Pos.	0.000
ATB T4	Primary	300.000	500.000	0	Z _{ps} = 16.80	15.00	300.000	0	0	0		
	Secondary	300.000	220.000	0	Z _{pt} = 42.80	15.00	300.000	0			Std Pos.	0.000
	Tertiary	75.000	33.000	0	Z _{st} = 24.32	15.00	300.000	0			Std Pos.	0.000
BANT TR1.2	Primary	200.000	110.000	0	Z _{ps} = 13.41	15.00	200.000	0	0	0		
	Secondary	200.000	33.000	0	Z _{pt} = 22.89	15.00	200.000	0			Std Pos.	0.000
	Tertiary	40.000	11.000	0	Z _{st} = 6.80	15.00	200.000	0			Std Pos.	0.000
FAR TR	Primary	120.000	110.000	0	Z _{ps} = 18.20	15.00	120.000	0	0	0		
	Secondary	80.000	33.000	0	Z _{pt} = 24.50	15.00	120.000	0			Std Pos.	0.000
	Tertiary	40.000	11.000	0	Z _{st} = 9.64	15.00	120.000	0			Std Pos.	0.000
GAD T1	Primary	60.000	220.000	1.25	Z _{ps} = 12.06	15.00	60.000	0	0	0		
	Secondary	60.000	110.000	0	Z _{pt} = 40.60	15.00	60.000	0			Std Pos.	0.000
	Tertiary	30.000	33.000	0	Z _{st} = 25.40	15.00	60.000	0			Std Pos.	0.000
GAM TR1	Primary	150.000	220.000	-6.25	Z _{ps} = 13.00	15.00	150.000	0	0	0		
	Secondary	150.000	110.000	0	Z _{pt} = 24.50	15.00	150.000	0			Std Pos.	0.000
	Tertiary	50.000	34.500	0	Z _{st} = 10.00	15.00	150.000	0			Std Pos.	0.000
GAM TR2	Primary	150.000	220.000	-6.25	Z _{ps} = 13.00	15.00	150.000	0	0	0		
	Secondary	150.000	110.000	0	Z _{pt} = 24.50	15.00	150.000	0			Std Pos.	0.000
	Tertiary	50.000	34.500	0	Z _{st} = 10.00	15.00	150.000	0			Std Pos.	0.000

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3-Winding Transformer Input Data

Transformer ID	Rating		Tap %	Impedance				Z Variation		Phase Shift		
	Winding	MVA		kV	% Z	X/R	MVA _B	% Tol.	+ 5%	- 5%	Type	Angle
IBA TR1	Primary	50.000	215.000	-5.00	Z _{ps} = 9.69	15.00	150.000	0	0	0		
	Secondary	50.000	110.000	0	Z _{pt} = 37.50	15.00	150.000	0			Std Pos.	0.000
	Tertiary	22.500	33.000	0	Z _{st} = 26.70	15.00	150.000	0			Std Pos.	0.000
IBA TR2	Primary	50.000	215.000	-5.00	Z _{ps} = 9.69	15.00	150.000	0	0	0		
	Secondary	50.000	110.000	0	Z _{pt} = 37.50	15.00	150.000	0			Std Pos.	0.000
	Tertiary	22.500	33.000	0	Z _{st} = 26.70	15.00	150.000	0			Std Pos.	0.000
IBA TR3	Primary	50.000	215.000	-5.00	Z _{ps} = 9.69	15.00	150.000	0	0	0		
	Secondary	50.000	110.000	0	Z _{pt} = 37.50	15.00	150.000	0			Std Pos.	0.000
	Tertiary	22.500	33.000	0	Z _{st} = 26.70	15.00	150.000	0			Std Pos.	0.000
IBA TR4,5	Primary	70.000	110.000	0	Z _{ps} = 20.00	15.00	70.000	0	0	0		
	Secondary	50.000	33.000	0	Z _{pt} = 24.30	15.00	70.000	0			Std Pos.	0.000
	Tertiary	20.000	11.000	0	Z _{st} = 14.49	15.00	70.000	0			Std Pos.	0.000
IZBA T1,2	Primary	200.000	110.000	0	Z _{ps} = 10.50	15.00	200.000	0	0	0		
	Secondary	200.000	33.000	0	Z _{pt} = 6.50	15.00	200.000	0			Std Pos.	0.000
	Tertiary	40.000	11.000	0	Z _{st} = 18.00	15.00	200.000	0			Std Pos.	0.000
IZG T1,4	Primary	200.000	110.000	-7.45	Z _{ps} = 12.64	15.00	200.000	0	0	0		
	Secondary	200.000	33.000	0	Z _{pt} = 24.02	15.00	200.000	0			Std Pos.	0.000
	Tertiary	80.000	11.000	0	Z _{st} = 7.93	15.00	200.000	0			Std Pos.	0.000
IZG TR2,3	Primary	35.000	110.000	0	Z _{ps} = 20.75	15.00	35.000	0	0	0		
	Secondary	25.000	33.000	0	Z _{pt} = 26.01	15.00	35.000	0			Std Pos.	0.000
	Tertiary	10.000	11.000	0	Z _{st} = 14.49	15.00	35.000	0			Std Pos.	0.000
JAS TR1	Primary	50.000	220.000	-8.75	Z _{ps} = 13.30	15.00	150.000	0	0	0		
	Secondary	50.000	115.000	0	Z _{pt} = 24.50	15.00	150.000	0			Std Pos.	0.000
	Tertiary	50.000	34.500	0	Z _{st} = 9.64	15.00	150.000	0			Std Pos.	0.000
JAS TR2	Primary	50.000	220.000	-8.75	Z _{ps} = 13.30	15.00	150.000	0	0	0		
	Secondary	50.000	115.000	0	Z _{pt} = 24.50	15.00	150.000	0			Std Pos.	0.000
	Tertiary	50.000	34.500	0	Z _{st} = 9.64	15.00	150.000	0			Std Pos.	0.000
KBA T1	Primary	300.000	500.000	1.25	Z _{ps} = 16.80	15.00	300.000	0	0	0		
	Secondary	300.000	220.000	5.00	Z _{pt} = 42.80	15.00	300.000	0			Std Pos.	0.000
	Tertiary	75.000	33.000	0	Z _{st} = 24.32	15.00	300.000	0			Std Pos.	0.000

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Transformer ID	Rating		Tap %	Impedance				Z Variation		Phase Shift		
	Winding	MVA		kV	% Z	X/R	MVA _B	% Tol.	+ 5%	- 5%	Type	Angle
KBA T2	Primary	300.000	500.000	1.25	Z _{ps} = 16.80	15.00	300.000	0	0	0		
	Secondary	300.000	220.000	5.00	Z _{pt} = 42.80	15.00	300.000	0			Std Pos.	0.000
	Tertiary	75.000	33.000	0	Z _{st} = 24.32	15.00	300.000	0			Std Pos.	0.000
KHE TR	Primary	200.000	110.000	0	Z _{ps} = 13.41	15.00	200.000	0	0	0		
	Secondary	200.000	33.000	0	Z _{pt} = 22.89	15.00	200.000	0			Std Pos.	0.000
	Tertiary	40.000	11.000	0	Z _{st} = 6.80	15.00	200.000	0			Std Pos.	0.000
KLX T4	Primary	100.000	215.000	0	Z _{ps} = 6.02	15.00	100.000	0	0	0		
	Secondary	100.000	110.000	0	Z _{pt} = 9.63	15.00	100.000	0			Std Pos.	0.000
	Tertiary	15.000	11.000	0	Z _{st} = 16.60	15.00	100.000	0			Std Pos.	0.000
KLX T6	Primary	100.000	215.000	0	Z _{ps} = 5.96	15.00	100.000	0	0	0		
	Secondary	100.000	110.000	0	Z _{pt} = 9.52	15.00	100.000	0			Std Pos.	0.000
	Tertiary	15.000	11.000	0	Z _{st} = 16.23	15.00	100.000	0			Std Pos.	0.000
KLX T8	Primary	100.000	215.000	0	Z _{ps} = 6.00	15.00	100.000	0	0	0		
	Secondary	100.000	110.000	0	Z _{pt} = 20.00	15.00	100.000	0			Std Pos.	0.000
	Tertiary	15.000	11.000	0	Z _{st} = 31.60	15.00	100.000	0			Std Pos.	0.000
KLX T10	Primary	100.000	215.000	0	Z _{ps} = 9.69	15.00	100.000	0	0	0		
	Secondary	100.000	110.000	0	Z _{pt} = 37.50	15.00	100.000	0			Std Pos.	0.000
	Tertiary	15.000	11.000	0	Z _{st} = 26.70	15.00	100.000	0			Std Pos.	0.000
KLX TR1,2	Primary	70.000	110.000	0	Z _{ps} = 20.00	15.00	70.000	0	0	0		
	Secondary	50.000	33.000	0	Z _{pt} = 26.01	15.00	70.000	0			Std Pos.	0.000
	Tertiary	20.000	11.000	0	Z _{st} = 14.49	15.00	70.000	0			Std Pos.	0.000
LOM TR	Primary	200.000	110.000	0	Z _{ps} = 13.41	15.00	200.000	0	0	0		
	Secondary	200.000	33.000	0	Z _{pt} = 22.89	15.00	200.000	0			Std Pos.	0.000
	Tertiary	80.000	11.000	0	Z _{st} = 6.80	15.00	200.000	0			Std Pos.	0.000
MAR T1	Primary	80.000	220.000	0	Z _{ps} = 14.10	15.00	80.000	0	0	0		
	Secondary	80.000	110.000	0	Z _{pt} = 23.60	15.00	80.000	0			Std Pos.	0.000
	Tertiary	15.000	11.000	0	Z _{st} = 7.90	15.00	80.000	0			Std Pos.	0.000
MAR T2	Primary	80.000	220.000	0	Z _{ps} = 14.10	15.00	80.000	0	0	0		
	Secondary	80.000	110.000	0	Z _{pt} = 23.60	15.00	80.000	0			Std Pos.	0.000
	Tertiary	15.000	11.000	0	Z _{st} = 7.90	15.00	80.000	0			Std Pos.	0.000

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3-Winding Transformer Input Data

Transformer ID	Rating		Tap %	Impedance				Z Variation		Phase Shift		
	Winding	MVA		kV	% Z	X/R	MVA _B	% Tol.	+ 5%	- 5%	Type	Angle
MAR T3,4	Primary	105.000	110.000	-7.45	Z _{ps} = 12.67	15.00	105.000	0	0	0		
	Secondary	95.000	33.000	0	Z _{pt} = 26.88	15.00	105.000	0			Std Pos.	0.000
	Tertiary	45.000	11.000	0	Z _{st} = 12.76	15.00	105.000	0			Std Pos.	0.000
MHDT2,3	Primary	70.000	110.000	-3.75	Z _{ps} = 24.54	15.00	70.000	0	0	0		
	Secondary	50.000	33.000	0	Z _{pt} = 20.48	15.00	70.000	0			Std Pos.	0.000
	Tertiary	20.000	11.000	0	Z _{st} = 15.54	15.00	70.000	0			Std Pos.	0.000
MHD TR4	Primary	150.000	220.000	-4.66	Z _{ps} = 12.67	15.00	150.000	0	0	0		
	Secondary	150.000	110.000	0	Z _{pt} = 26.88	15.00	150.000	0			Std Pos.	0.000
	Tertiary	50.000	33.000	0	Z _{st} = 12.76	15.00	150.000	0			Std Pos.	0.000
MHD TR5	Primary	150.000	220.000	-4.66	Z _{ps} = 12.67	15.00	150.000	0	0	0		
	Secondary	150.000	110.000	0	Z _{pt} = 26.88	15.00	150.000	0			Std Pos.	0.000
	Tertiary	50.000	33.000	0	Z _{st} = 12.76	15.00	150.000	0			Std Pos.	0.000
MHD TR6	Primary	150.000	220.000	-4.66	Z _{ps} = 12.67	15.00	150.000	0	0	0		
	Secondary	150.000	110.000	0	Z _{pt} = 26.88	15.00	150.000	0			Std Pos.	0.000
	Tertiary	50.000	33.000	0	Z _{st} = 12.76	15.00	150.000	0			Std Pos.	0.000
MRK T1	Primary	300.000	500.000	0	Z _{ps} = 16.97	15.00	300.000	0	0	0		
	Secondary	300.000	220.000	5.00	Z _{pt} = 43.36	15.00	300.000	0			Std Pos.	0.000
	Tertiary	75.000	33.000	0	Z _{st} = 24.56	15.00	300.000	0			Std Pos.	0.000
MRK T2	Primary	300.000	500.000	0	Z _{ps} = 16.97	15.00	300.000	0	0	0		
	Secondary	300.000	220.000	5.00	Z _{pt} = 43.36	15.00	300.000	0			Std Pos.	0.000
	Tertiary	75.000	33.000	0	Z _{st} = 24.56	15.00	300.000	0			Std Pos.	0.000
MRK T3	Primary	300.000	500.000	0	Z _{ps} = 16.97	15.00	300.000	0	0	0		
	Secondary	300.000	220.000	5.00	Z _{pt} = 43.36	15.00	300.000	0			Std Pos.	0.000
	Tertiary	75.000	33.000	0	Z _{st} = 24.56	15.00	300.000	0			Std Pos.	0.000
MUG TR1	Primary	100.000	110.000	0	Z _{ps} = 11.60	15.00	100.000	0	0	0		
	Secondary	100.000	33.000	0	Z _{pt} = 21.80	15.00	100.000	0			Std Pos.	0.000
	Tertiary	30.000	11.000	0	Z _{st} = 8.00	15.00	100.000	0			Std Pos.	0.000
MUG TR3	Primary	100.000	110.000	0	Z _{ps} = 11.60	15.00	100.000	0	0	0		
	Secondary	100.000	33.000	0	Z _{pt} = 21.80	15.00	100.000	0			Std Pos.	0.000
	Tertiary	30.000	11.000	0	Z _{st} = 8.00	15.00	100.000	0			Std Pos.	0.000

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3-Winding Transformer Input Data

Transformer ID	Rating		Tap %	Impedance				Z Variation		Phase Shift		
	Winding	MVA		kV	% Z	X/R	MVA _B	% Tol.	+ 5%	- 5%	Type	Angle
MWP T1	Primary	282.000	525.000	0	Z _{ps} = 24.62	15.00	282.000	0	0	0		
	Secondary	41.000	13.800	0	Z _{pt} = 24.56	15.00	282.000	0			Std Pos.	0.000
	Tertiary	41.000	13.800	0	Z _{st} = 49.30	15.00	282.000	0			Std Pos.	0.000
MWP T2	Primary	282.000	525.000	0	Z _{ps} = 24.62	15.00	282.000	0	0	0		
	Secondary	41.000	13.800	0	Z _{pt} = 24.56	15.00	282.000	0			Std Pos.	0.000
	Tertiary	41.000	13.800	0	Z _{st} = 49.30	15.00	282.000	0			Std Pos.	0.000
MWP T3	Primary	282.000	525.000	0	Z _{ps} = 24.62	15.00	282.000	0	0	0		
	Secondary	41.000	13.800	0	Z _{pt} = 24.56	15.00	282.000	0			Std Pos.	0.000
	Tertiary	41.000	13.800	0	Z _{st} = 49.30	15.00	282.000	0			Std Pos.	0.000
MWP T4	Primary	282.000	525.000	0	Z _{ps} = 24.62	15.00	282.000	0	0	0		
	Secondary	41.000	13.800	0	Z _{pt} = 24.56	15.00	282.000	0			Std Pos.	0.000
	Tertiary	41.000	13.800	0	Z _{st} = 49.30	15.00	282.000	0			Std Pos.	0.000
MWP T5	Primary	282.000	525.000	0	Z _{ps} = 24.62	15.00	282.000	0	0	0		
	Secondary	41.000	13.800	0	Z _{pt} = 24.56	15.00	282.000	0			Std Pos.	0.000
	Tertiary	41.000	13.800	0	Z _{st} = 49.30	15.00	282.000	0			Std Pos.	0.000
N HAS T1	Primary	150.000	220.000	-4.97	Z _{ps} = 13.00	15.00	150.000	0	0	0		
	Secondary	50.000	110.000	0	Z _{pt} = 22.50	15.00	150.000	0			Std Pos.	0.000
	Tertiary	50.000	11.000	0	Z _{st} = 8.00	15.00	150.000	0			Std Pos.	0.000
N HAS T2	Primary	150.000	220.000	-4.97	Z _{ps} = 13.00	15.00	150.000	0	0	0		
	Secondary	50.000	110.000	0	Z _{pt} = 22.50	15.00	150.000	0			Std Pos.	0.000
	Tertiary	50.000	11.000	0	Z _{st} = 8.00	15.00	150.000	0			Std Pos.	0.000
OMD T2	Primary	35.000	110.000	-7.45	Z _{ps} = 20.20	15.00	35.000	0	0	0		
	Secondary	25.000	33.000	0	Z _{pt} = 14.60	15.00	35.000	0			Std Pos.	0.000
	Tertiary	10.000	11.000	0	Z _{st} = 26.00	15.00	35.000	0			Std Pos.	0.000
OMD TR 1,3	Primary	200.000	110.000	0	Z _{ps} = 12.10	15.00	200.000	0	0	0		
	Secondary	200.000	33.000	0	Z _{pt} = 22.14	15.00	200.000	0			Std Pos.	0.000
	Tertiary	60.000	11.000	0	Z _{st} = 7.89	15.00	200.000	0			Std Pos.	0.000
POR T1,2	Primary	200.000	220.000	-7.45	Z _{ps} = 12.67	15.00	200.000	0	0	0		
	Secondary	200.000	110.000	0	Z _{pt} = 26.88	15.00	200.000	0			Std Pos.	0.000
	Tertiary	60.000	33.000	0	Z _{st} = 12.76	15.00	200.000	0			Std Pos.	0.000

ETAP

Project:
Location:
Contract:
Engineer:
Filename: NG

Study Case: 3-Winding Transformer

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Revision: Base
Config.: 3-Winding Transformer

3-Winding Transformer Input Data

Transformer ID	Rating		Tap	Impedance				Z Variation		Phase Shift		
	Winding	MVA	kV	%	% Z	X/R	MVA _b	% Tol.	+ 5%	- 5%	Type	Angle
ROS T1	Primary:	86.000	220.000	-5.00	Z _{ps} = 17.90	15.00	86.000	0	0	0		
	Secondary:	43.000	11.000	0	Z _{pt} = 17.90	15.00	86.000	0			Std Pos.	0.000
	Tertiary:	43.000	11.000	0	Z _{st} = 34.30	15.00	86.000	0			Std Pos.	0.000
ROS T2	Primary:	86.000	220.000	-5.00	Z _{ps} = 17.90	15.00	86.000	0	0	0		
	Secondary:	43.000	11.000	0	Z _{pt} = 17.90	15.00	86.000	0			Std Pos.	0.000
	Tertiary:	43.000	11.000	0	Z _{st} = 34.30	15.00	86.000	0			Std Pos.	0.000
ROS T3	Primary:	86.000	220.000	-5.00	Z _{ps} = 17.90	15.00	86.000	0	0	0		
	Secondary:	43.000	11.000	0	Z _{pt} = 17.90	15.00	86.000	0			Std Pos.	0.000
	Tertiary:	43.000	11.000	0	Z _{st} = 34.30	15.00	86.000	0			Std Pos.	0.000
ROS T4	Primary:	86.000	220.000	-5.00	Z _{ps} = 17.90	15.00	86.000	0	0	0		
	Secondary:	43.000	11.000	0	Z _{pt} = 17.90	15.00	86.000	0			Std Pos.	0.000
	Tertiary:	43.000	11.000	0	Z _{st} = 34.30	15.00	86.000	0			Std Pos.	0.000
SHG TR	Primary:	70.000	110.000	0	Z _{ps} = 15.00	15.00	70.000	0	0	0		
	Secondary:	50.000	33.000	0	Z _{pt} = 25.60	15.00	70.000	0			Std Pos.	0.000
	Tertiary:	20.000	11.000	0	Z _{st} = 14.20	15.00	70.000	0			Std Pos.	0.000
SNJ T1	Primary:	55.000	220.000	0	Z _{ps} = 7.70	15.00	55.000	0	0	0		
	Secondary:	55.000	110.000	0	Z _{pt} = 25.90	15.00	55.000	0			Std Pos.	0.000
	Tertiary:	17.500	11.000	0	Z _{st} = 16.90	15.00	55.000	0			Std Pos.	0.000
SNJ T2	Primary:	55.000	220.000	0	Z _{ps} = 8.00	15.00	55.000	0	0	0		
	Secondary:	55.000	110.000	0	Z _{pt} = 39.90	15.00	55.000	0			Std Pos.	0.000
	Tertiary:	30.000	33.000	0	Z _{st} = 30.60	15.00	55.000	0			Std Pos.	0.000
T23	Primary:	70.000	110.000	0	Z _{ps} = 15.00	15.00	70.000	0	0	0		
	Secondary:	50.000	33.000	0	Z _{pt} = 25.60	15.00	70.000	0			Std Pos.	0.000
	Tertiary:	20.000	11.000	0	Z _{st} = 14.20	15.00	70.000	0			Std Pos.	0.000
T68	Primary:	200.000	110.000	0	Z _{ps} = 13.41	15.00	200.000	0	0	0		
	Secondary:	200.000	33.000	0	Z _{pt} = 22.89	15.00	200.000	0			Std Pos.	0.000
	Tertiary:	40.000	11.000	0	Z _{st} = 6.80	15.00	200.000	0			Std Pos.	0.000