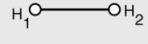
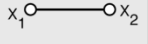
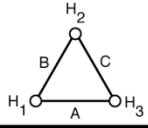
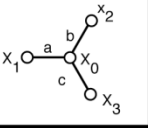
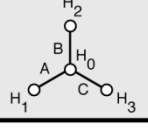
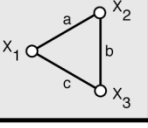
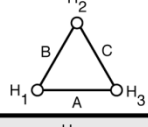
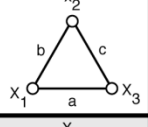
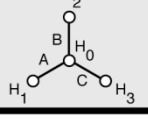
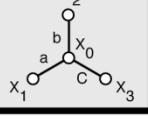


## Common ANSI Transformer Descriptions

STD TEST NO.	TRANSFORMER CONFIGURATION		PHASE	WINDING TESTED		TURNS RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)		HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
1			1 ∅	H <sub>1</sub> - H <sub>2</sub>	X <sub>1</sub> - X <sub>2</sub>	$\frac{V_H}{V_X}$	1ph0	SNG - PHS
2			A	H <sub>1</sub> - H <sub>3</sub>	X <sub>1</sub> - X <sub>0</sub>	$\frac{V_H \cdot \sqrt{3}}{V_X}$	Dyn1	dt - Y
			B	H <sub>2</sub> - H <sub>1</sub>	X <sub>2</sub> - X <sub>0</sub>			
			C	H <sub>3</sub> - H <sub>2</sub>	X <sub>3</sub> - X <sub>0</sub>			
3			A	H <sub>1</sub> - H <sub>0</sub>	X <sub>1</sub> - X <sub>2</sub>	$\frac{V_H}{V_X \cdot \sqrt{3}}$	YNd1	y - dt
			B	H <sub>2</sub> - H <sub>0</sub>	X <sub>2</sub> - X <sub>3</sub>			
			C	H <sub>3</sub> - H <sub>0</sub>	X <sub>3</sub> - X <sub>1</sub>			
4			A	H <sub>1</sub> - H <sub>3</sub>	X <sub>1</sub> - X <sub>3</sub>	$\frac{V_H}{V_X}$	Dd0	dt - dt
			B	H <sub>2</sub> - H <sub>1</sub>	X <sub>2</sub> - X <sub>1</sub>			
			C	H <sub>3</sub> - H <sub>2</sub>	X <sub>3</sub> - X <sub>2</sub>			
5			A	H <sub>1</sub> - H <sub>0</sub>	X <sub>1</sub> - X <sub>0</sub>	$\frac{V_H}{V_X}$	YNyn0	y - y
			B	H <sub>2</sub> - H <sub>0</sub>	X <sub>2</sub> - X <sub>0</sub>			
			C	H <sub>3</sub> - H <sub>0</sub>	X <sub>3</sub> - X <sub>0</sub>			

SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
1			—	A	H <sub>1</sub> - H <sub>3</sub>	X <sub>3</sub> - X <sub>1</sub>	$\frac{V_H}{V_X}$	Dd6	
				B	H <sub>2</sub> - H <sub>1</sub>	X <sub>1</sub> - X <sub>2</sub>			
				C	H <sub>3</sub> - H <sub>2</sub>	X <sub>2</sub> - X <sub>3</sub>			
37			—	A	H <sub>1</sub> - H <sub>3</sub>	X <sub>1</sub> - X <sub>3</sub>	$\frac{V_H}{V_X}$	Dd0	
				B	H <sub>2</sub> - H <sub>1</sub>	X <sub>2</sub> - X <sub>1</sub>			
				C	H <sub>3</sub> - H <sub>2</sub>	X <sub>3</sub> - X <sub>2</sub>			
38			—	A	H <sub>1</sub> - H <sub>2</sub>	X <sub>3</sub> - X <sub>2</sub>	$\frac{V_H}{V_X}$	Dd2	
				B	H <sub>2</sub> - H <sub>3</sub>	X <sub>1</sub> - X <sub>3</sub>			
				C	H <sub>3</sub> - H <sub>1</sub>	X <sub>2</sub> - X <sub>1</sub>			
39			—	A	H <sub>1</sub> - H <sub>2</sub>	X <sub>3</sub> - X <sub>1</sub>	$\frac{V_H}{V_X}$	Dd4	
				B	H <sub>2</sub> - H <sub>3</sub>	X <sub>1</sub> - X <sub>2</sub>			
				C	H <sub>3</sub> - H <sub>1</sub>	X <sub>2</sub> - X <sub>3</sub>			
40			—	A	H <sub>1</sub> - H <sub>2</sub>	X <sub>2</sub> - X <sub>3</sub>	$\frac{V_H}{V_X}$	Dd8	
				B	H <sub>2</sub> - H <sub>3</sub>	X <sub>3</sub> - X <sub>1</sub>			
				C	H <sub>3</sub> - H <sub>1</sub>	X <sub>1</sub> - X <sub>2</sub>			
41			—	A	H <sub>1</sub> - H <sub>2</sub>	X <sub>1</sub> - X <sub>3</sub>	$\frac{V_H}{V_X}$	Dd10	
				B	H <sub>2</sub> - H <sub>3</sub>	X <sub>2</sub> - X <sub>1</sub>			
				C	H <sub>3</sub> - H <sub>1</sub>	X <sub>3</sub> - X <sub>2</sub>			
42			—	A	H <sub>1</sub> - H <sub>3</sub>	X <sub>1</sub> - X <sub>0</sub>	$\frac{V_H \cdot \sqrt{3}}{V_X}$	Dyn1	
				B	H <sub>2</sub> - H <sub>1</sub>	X <sub>2</sub> - X <sub>0</sub>			
				C	H <sub>3</sub> - H <sub>2</sub>	X <sub>3</sub> - X <sub>0</sub>			
2			H <sub>3</sub> -H <sub>2</sub> H <sub>1</sub> -H <sub>3</sub> H <sub>2</sub> -H <sub>1</sub>	A	H <sub>1</sub> - H <sub>3</sub>	X <sub>1</sub> - X <sub>3</sub>	$\frac{V_H \cdot \sqrt{3}}{V_X}$	Dy1	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	H <sub>2</sub> - H <sub>1</sub>	X <sub>2</sub> - X <sub>1</sub>			
				C	H <sub>3</sub> - H <sub>2</sub>	X <sub>3</sub> - X <sub>2</sub>			
61			H <sub>3</sub> -H <sub>2</sub> H <sub>1</sub> -H <sub>3</sub> H <sub>2</sub> -H <sub>1</sub>	A	H <sub>1</sub> - H <sub>3</sub>	X <sub>1</sub> - X <sub>2</sub>	$\frac{V_H \cdot \sqrt{3}}{V_X}$	Dy3	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	H <sub>2</sub> - H <sub>1</sub>	X <sub>2</sub> - X <sub>3</sub>			
				C	H <sub>3</sub> - H <sub>2</sub>	X <sub>3</sub> - X <sub>1</sub>			
62			—	A	H <sub>1</sub> - H <sub>3</sub>	X <sub>0</sub> - X <sub>2</sub>	$\frac{V_H \cdot \sqrt{3}}{V_X}$	Dyn3	
				B	H <sub>2</sub> - H <sub>1</sub>	X <sub>0</sub> - X <sub>3</sub>			
				C	H <sub>3</sub> - H <sub>2</sub>	X <sub>0</sub> - X <sub>1</sub>			

SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
3			—	A	H1-H3	X3-X0	$\frac{V_H \cdot \sqrt{3}}{V_X}$	Dyn5	
				B	H2-H1	X1-X0			
				C	H3-H2	X2-X0			
4			H3-H2	A	H1-H3	X3-X2	$\frac{V_H \cdot \sqrt{3}}{V_X}$	Dy5	NO ACCESSIBLE NEUTRAL ON WYE WINDING
			H1-H3	B	H2-H1	X1-X3			
			H2-H1	C	H3-H2	X2-X1			
5			—	A	H1-H3	X0-X1	$\frac{V_H \cdot \sqrt{3}}{V_X}$	Dyn7	
				B	H2-H1	X0-X2			
				C	H3-H2	X0-X3			
6			H3-H2	A	H1-H3	X3-X1	$\frac{V_H \cdot \sqrt{3}}{V_X}$	Dy7	NO ACCESSIBLE NEUTRAL ON WYE WINDING
			H1-H3	B	H2-H1	X1-X2			
			H2-H1	C	H3-H2	X2-X3			
63			—	A	H1-H3	X2-X1	$\frac{V_H \cdot \sqrt{3}}{V_X}$	Dy9	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	H2-H1	X3-X2			
				C	H3-H2	X1-X3			
64			—	A	H1-H3	X2-X0	$\frac{V_H \cdot \sqrt{3}}{V_X}$	Dyn9	
				B	H2-H1	X3-X0			
				C	H3-H2	X1-X0			
7			—	A	H1-H3	X0-X3	$\frac{V_H \cdot \sqrt{3}}{V_X}$	Dyn11	
				B	H2-H1	X0-X1			
				C	H3-H2	X0-X2			
8			H3-H2	A	H1-H3	X2-X3	$\frac{V_H \cdot \sqrt{3}}{V_X}$	Dy11	NO ACCESSIBLE NEUTRAL ON WYE WINDING
			H1-H3	B	H2-H1	X3-X1			
			H2-H1	C	H3-H2	X1-X2			
45			—	A	H1-H2	X1-X0	$\frac{3}{2} \cdot \frac{V_H}{V_X}$	Dzn0	
				B	H2-H3	X2-X0			
				C	H3-H1	X3-X0			
46			—	A	H1-H2	X0-X2	$\frac{3}{2} \cdot \frac{V_H}{V_X}$	Dzn2	
				B	H2-H3	X0-X3			
				C	H3-H1	X0-X1			

SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
47			—	A	H1 - H2	X3 - X2	$\frac{V_H}{V_X}$	Dz2	NO ACCESSIBLE NEUTRAL
				B	H2 - H3	X1 - X3			
				C	H3 - H1	X2 - X1			
48			H2-H3 H3-H1 H1-H2	A	H1 - H2	X3 - X0	$\frac{3}{2} \cdot \frac{V_H}{V_X}$	Dzn4	
				B	H2 - H3	X1 - X0			
				C	H3 - H1	X2 - X0			
49			—	A	H1 - H2	X3 - X1	$\frac{V_H}{V_X}$	Dz4	NO ACCESSIBLE NEUTRAL
				B	H2 - H3	X1 - X2			
				C	H3 - H1	X2 - X3			
9			—	A	H1 - H3	X1 - X3	$\frac{V_H}{V_X}$	Dz0	NO ACCESSIBLE NEUTRAL
				B	H2 - H1	X2 - X1			
				C	H3 - H2	X3 - X2			
10			—	A	H1 - H3	X3 - X1	$\frac{V_H}{V_X}$	Dz6	NO ACCESSIBLE NEUTRAL
				B	H2 - H1	X1 - X2			
				C	H3 - H2	X2 - X3			
50			H2-H3 H3-H1 H1-H2	A	H1 - H2	X0 - X1	$\frac{3}{2} \cdot \frac{V_H}{V_X}$	Dzn6	
				B	H2 - H3	X0 - X2			
				C	H3 - H1	X0 - X3			
51			H2-H3 H3-H1 H1-H2	A	H1 - H2	X2 - X0	$\frac{3}{2} \cdot \frac{V_H}{V_X}$	Dzn8	
				B	H2 - H3	X3 - X0			
				C	H3 - H1	X1 - X0			
52			—	A	H1 - H2	X2 - X3	$\frac{V_H}{V_X}$	Dz8	NO ACCESSIBLE NEUTRAL
				B	H2 - H3	X3 - X1			
				C	H3 - H1	X1 - X2			
53			H2-H3 H3-H1 H1-H2	A	H1 - H2	X0 - X3	$\frac{3}{2} \cdot \frac{V_H}{V_X}$	Dzn10	
				B	H2 - H3	X0 - X1			
				C	H3 - H1	X0 - X2			
54			—	A	H1 - H2	X1 - X3	$\frac{V_H}{V_X}$	Dz10	NO ACCESSIBLE NEUTRAL
				B	H2 - H3	X2 - X1			
				C	H3 - H1	X3 - X2			

SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
11			—	A	H1 - H0	X2 - X1	$\frac{V_H}{V_X \cdot \sqrt{3}}$	YNd7	
				B	H2 - H0	X3 - X2			
				C	H3 - H0	X1 - X3			
44			—	A	H1 - H0	X1 - X2	$\frac{V_H}{V_X \cdot \sqrt{3}}$	YNd1	
				B	H2 - H0	X2 - X3			
				C	H3 - H0	X3 - X1			
12			H3-H2	A	H1 - H3	X1 - X2	$\frac{V_H \cdot \sqrt{3}}{V_X \cdot 2}$	Yd1	NO ACCESSIBLE NEUTRAL ON WYE WINDING
			H1-H3	B	H2 - H1	X2 - X3			
			H2-H1	C	H3 - H2	X3 - X1			
13			—	A	H1 - H0	X3 - X2	$\frac{V_H}{V_X \cdot \sqrt{3}}$	YNd5	
				B	H2 - H0	X1 - X2			
				C	H3 - H0	X2 - X3			
14			H3-H2	A	H1 - H3	X3 - X1	$\frac{V_H \cdot \sqrt{3}}{V_X \cdot 2}$	Yd5	NO ACCESSIBLE NEUTRAL ON WYE WINDING
			H1-H3	B	H2 - H1	X1 - X2			
			H2-H1	C	H3 - H2	X2 - X3			
15			H3-H2	A	H1 - H3	X2 - X1	$\frac{V_H \cdot \sqrt{3}}{V_X \cdot 2}$	Yd7	NO ACCESSIBLE NEUTRAL ON WYE WINDING
			H1-H3	B	H2 - H1	X3 - X2			
			H2-H1	C	H3 - H2	X1 - X3			
16			—	A	H1 - H0	X1 - X3	$\frac{V_H}{V_X \cdot \sqrt{3}}$	YNd11	
				B	H2 - H0	X2 - X1			
				C	H3 - H0	X3 - X2			
17			H3-H2	A	H1 - H3	X1 - X3	$\frac{V_H \cdot \sqrt{3}}{V_X \cdot 2}$	Yd11	NO ACCESSIBLE NEUTRAL ON WYE WINDING
			H1-H3	B	H2 - H1	X2 - X1			
			H2-H1	C	H3 - H2	X3 - X2			
18			—	A	H1 - H0	X0 - X1	$\frac{V_H}{V_X}$	YNyn6	
				B	H2 - H0	X0 - X2			
				C	H3 - H0	X0 - X3			
19			H2-H0	A	H1 - H0	X1 - X2	$\frac{V_H}{V_X}$	YNy0	NO ACCESSIBLE NEUTRAL ON LOW VOLTAGE WINDING
			H3-H0	B	H2 - H0	X2 - X3			
			H1-H0	C	H3 - H0	X3 - X1			

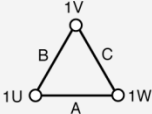
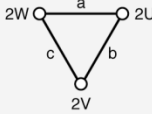
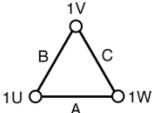
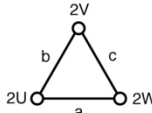
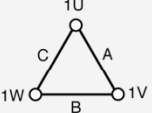
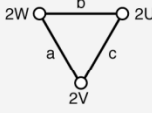
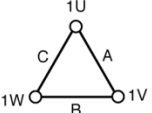
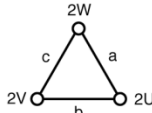
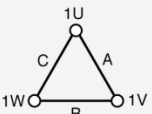
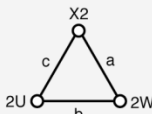
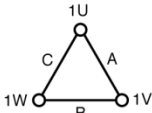
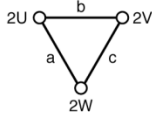
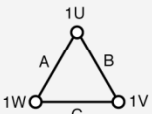
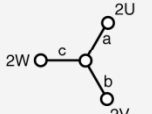
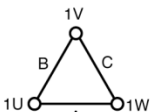
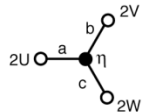
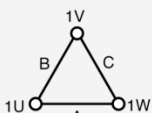
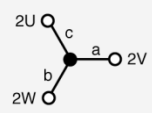
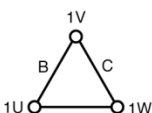
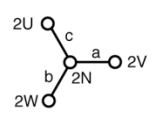
SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
20			X <sub>3</sub> -X <sub>0</sub> X <sub>1</sub> -X <sub>0</sub> X <sub>2</sub> -X <sub>0</sub>	A B C	H <sub>1</sub> - H <sub>3</sub> H <sub>2</sub> - H <sub>1</sub> H <sub>3</sub> - H <sub>2</sub>	X <sub>1</sub> - X <sub>0</sub> X <sub>2</sub> - X <sub>0</sub> X <sub>3</sub> - X <sub>0</sub>	$\frac{V_H}{V_X}$	Yyn0	NO ACCESSIBLE NEUTRAL ON HIGH VOLTAGE WINDING
43			—	A B C	H <sub>1</sub> - H <sub>0</sub> H <sub>2</sub> - H <sub>0</sub> H <sub>3</sub> - H <sub>0</sub>	X <sub>1</sub> - X <sub>0</sub> X <sub>2</sub> - X <sub>0</sub> X <sub>3</sub> - X <sub>0</sub>	$\frac{V_H}{V_L}$	YNyn0	
21			—	A B C	H <sub>1</sub> - H <sub>3</sub> H <sub>2</sub> - H <sub>1</sub> H <sub>3</sub> - H <sub>2</sub>	X <sub>1</sub> - X <sub>3</sub> X <sub>2</sub> - X <sub>1</sub> X <sub>3</sub> - X <sub>2</sub>	$\frac{V_H}{V_X}$	Yy0	NO ACCESSIBLE NEUTRAL
22			H <sub>2</sub> -H <sub>0</sub> H <sub>3</sub> -H <sub>0</sub> H <sub>1</sub> -H <sub>0</sub>	A B C	H <sub>1</sub> - H <sub>0</sub> H <sub>2</sub> - H <sub>0</sub> H <sub>3</sub> - H <sub>0</sub>	X <sub>2</sub> - X <sub>1</sub> X <sub>3</sub> - X <sub>2</sub> X <sub>1</sub> - X <sub>3</sub>	$\frac{V_H}{V_X}$	YNy6	NO ACCESSIBLE NEUTRAL ON LOW VOLTAGE WINDING
23			X <sub>3</sub> -X <sub>0</sub> X <sub>1</sub> -X <sub>0</sub> X <sub>2</sub> -X <sub>0</sub>	A B C	H <sub>1</sub> - H <sub>3</sub> H <sub>2</sub> - H <sub>1</sub> H <sub>3</sub> - H <sub>2</sub>	X <sub>0</sub> - X <sub>1</sub> X <sub>0</sub> - X <sub>2</sub> X <sub>0</sub> - X <sub>3</sub>	$\frac{V_H}{V_X}$	Yyn6	NO ACCESSIBLE NEUTRAL ON HIGH VOLTAGE WINDING
24			—	A B C	H <sub>1</sub> - H <sub>3</sub> H <sub>2</sub> - H <sub>1</sub> H <sub>3</sub> - H <sub>2</sub>	X <sub>3</sub> - X <sub>1</sub> X <sub>1</sub> - X <sub>2</sub> X <sub>2</sub> - X <sub>3</sub>	$\frac{V_H}{V_X}$	Yy6	NO ACCESSIBLE NEUTRAL
65			—	A B C	H <sub>1</sub> - H <sub>3</sub> H <sub>2</sub> - H <sub>1</sub> H <sub>3</sub> - H <sub>2</sub>	X <sub>1</sub> - X <sub>0</sub> X <sub>2</sub> - X <sub>0</sub> X <sub>3</sub> - X <sub>0</sub>	$\frac{V_H \cdot \sqrt{3}}{V_X}$	YNzn1	
25			—	A B C	H <sub>1</sub> - H <sub>3</sub> H <sub>2</sub> - H <sub>1</sub> H <sub>3</sub> - H <sub>2</sub>	X <sub>1</sub> - X <sub>0</sub> X <sub>2</sub> - X <sub>0</sub> X <sub>3</sub> - X <sub>0</sub>	$\frac{V_H \cdot \sqrt{3}}{V_X}$	Yzn1	NO ACCESSIBLE NEUTRAL ON WYE WINDING
26			H <sub>3</sub> -H <sub>2</sub> H <sub>1</sub> -H <sub>3</sub> H <sub>2</sub> -H <sub>1</sub>	A B C	H <sub>1</sub> - H <sub>3</sub> H <sub>2</sub> - H <sub>1</sub> H <sub>3</sub> - H <sub>2</sub>	X <sub>1</sub> - X <sub>2</sub> X <sub>2</sub> - X <sub>3</sub> X <sub>3</sub> - X <sub>1</sub>	$\frac{V_H \cdot \sqrt{3}}{V_X \cdot 2}$	Yz1	NO ACCESSIBLE NEUTRAL
27			—	A B C	H <sub>1</sub> - H <sub>3</sub> H <sub>2</sub> - H <sub>1</sub> H <sub>3</sub> - H <sub>2</sub>	X <sub>3</sub> - X <sub>0</sub> X <sub>1</sub> - X <sub>0</sub> X <sub>2</sub> - X <sub>0</sub>	$\frac{V_H \cdot \sqrt{3}}{V_X}$	Yzn5	NO ACCESSIBLE NEUTRAL ON WYE WINDING

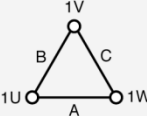
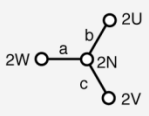
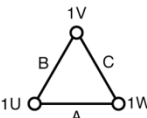
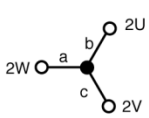
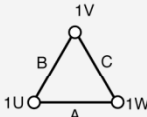
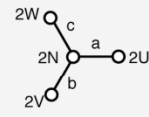
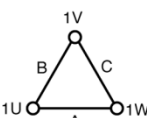
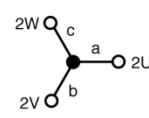
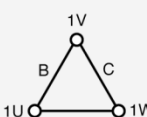
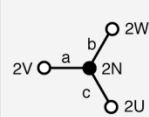
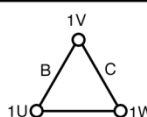
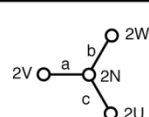
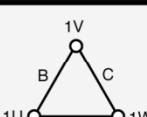
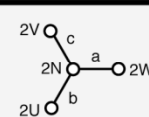
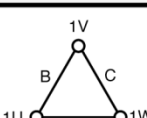
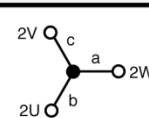
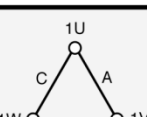
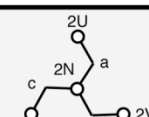
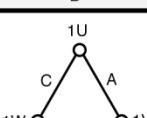
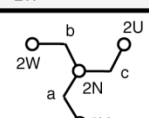
SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
28			H <sub>3</sub> -H <sub>2</sub> H <sub>1</sub> -H <sub>3</sub> H <sub>2</sub> -H <sub>1</sub>	A B C	H <sub>1</sub> -H <sub>3</sub> H <sub>2</sub> -H <sub>1</sub> H <sub>3</sub> -H <sub>2</sub>	X <sub>3</sub> -X <sub>1</sub> X <sub>1</sub> -X <sub>2</sub> X <sub>2</sub> -X <sub>3</sub>	$\frac{V_H \cdot \sqrt{3}}{V_X \cdot 2}$	Yz5	NO ACCESSIBLE NEUTRAL
66			—	A B C	H <sub>1</sub> -H <sub>3</sub> H <sub>2</sub> -H <sub>1</sub> H <sub>3</sub> -H <sub>2</sub>	X <sub>0</sub> -X <sub>1</sub> X <sub>0</sub> -X <sub>2</sub> X <sub>0</sub> -X <sub>3</sub>	$\frac{V_H \cdot \sqrt{3}}{V_X}$	YNzn7	
29			—	A B C	H <sub>1</sub> -H <sub>3</sub> H <sub>2</sub> -H <sub>1</sub> H <sub>3</sub> -H <sub>2</sub>	X <sub>0</sub> -X <sub>1</sub> X <sub>0</sub> -X <sub>2</sub> X <sub>0</sub> -X <sub>3</sub>	$\frac{V_H \cdot \sqrt{3}}{V_X}$	Yzn7	NO ACCESSIBLE NEUTRAL ON WYE WINDING
30			H <sub>3</sub> -H <sub>2</sub> H <sub>1</sub> -H <sub>3</sub> H <sub>2</sub> -H <sub>1</sub>	A B C	H <sub>1</sub> -H <sub>3</sub> H <sub>2</sub> -H <sub>1</sub> H <sub>3</sub> -H <sub>2</sub>	X <sub>2</sub> -X <sub>1</sub> X <sub>3</sub> -X <sub>2</sub> X <sub>1</sub> -X <sub>3</sub>	$\frac{V_H \cdot \sqrt{3}}{V_X \cdot 2}$	Yz7	NO ACCESSIBLE NEUTRAL
67			—	A B C	H <sub>1</sub> -H <sub>3</sub> H <sub>2</sub> -H <sub>1</sub> H <sub>3</sub> -H <sub>2</sub>	X <sub>0</sub> -X <sub>3</sub> X <sub>0</sub> -X <sub>1</sub> X <sub>0</sub> -X <sub>2</sub>	$\frac{V_H \cdot \sqrt{3}}{V_X}$	YNzn11	
31			—	A B C	H <sub>1</sub> -H <sub>3</sub> H <sub>2</sub> -H <sub>1</sub> H <sub>3</sub> -H <sub>2</sub>	X <sub>0</sub> -X <sub>3</sub> X <sub>0</sub> -X <sub>1</sub> X <sub>0</sub> -X <sub>2</sub>	$\frac{V_H \cdot \sqrt{3}}{V_X}$	Yzn11	NO ACCESSIBLE NEUTRAL ON WYE WINDING
32			H <sub>3</sub> -H <sub>2</sub> H <sub>1</sub> -H <sub>3</sub> H <sub>2</sub> -H <sub>1</sub>	A B C	H <sub>1</sub> -H <sub>3</sub> H <sub>2</sub> -H <sub>1</sub> H <sub>3</sub> -H <sub>2</sub>	X <sub>1</sub> -X <sub>3</sub> X <sub>2</sub> -X <sub>1</sub> X <sub>3</sub> -X <sub>2</sub>	$\frac{V_H \cdot \sqrt{3}}{V_X \cdot 2}$	Yz11	NO ACCESSIBLE NEUTRAL
55			X <sub>2</sub> -X <sub>3</sub> X <sub>3</sub> -X <sub>1</sub> X <sub>1</sub> -X <sub>2</sub>	A B C	H <sub>1</sub> -H <sub>0</sub> H <sub>2</sub> -H <sub>0</sub> H <sub>3</sub> -H <sub>0</sub>	X <sub>1</sub> -X <sub>2</sub> X <sub>2</sub> -X <sub>3</sub> X <sub>3</sub> -X <sub>1</sub>	$\frac{2}{3} \cdot \frac{V_H}{V_X}$	ZNd0	
56			—	A B C	H <sub>1</sub> -H <sub>2</sub> H <sub>2</sub> -H <sub>3</sub> H <sub>3</sub> -H <sub>1</sub>	X <sub>1</sub> -X <sub>2</sub> X <sub>2</sub> -X <sub>3</sub> X <sub>3</sub> -X <sub>1</sub>	$\frac{V_H}{V_X}$	Zd0	NO ACCESSIBLE NEUTRAL ON HIGH VOLTAGE
57			X <sub>2</sub> -X <sub>3</sub> X <sub>3</sub> -X <sub>1</sub> X <sub>1</sub> -X <sub>2</sub>	A B C	H <sub>1</sub> -H <sub>0</sub> H <sub>2</sub> -H <sub>0</sub> H <sub>3</sub> -H <sub>0</sub>	X <sub>2</sub> -X <sub>1</sub> X <sub>3</sub> -X <sub>2</sub> X <sub>1</sub> -X <sub>3</sub>	$\frac{2}{3} \cdot \frac{V_H}{V_X}$	ZNd6	

SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
33			—	A	H <sub>1</sub> - H <sub>0</sub>	X <sub>3</sub> - X <sub>1</sub>	$\frac{V_H}{V_x \cdot \sqrt{3}}$	ZNy5	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	H <sub>2</sub> - H <sub>0</sub>	X <sub>1</sub> - X <sub>2</sub>			
				C	H <sub>3</sub> - H <sub>0</sub>	X <sub>2</sub> - X <sub>3</sub>			
34			H <sub>3</sub> -H <sub>2</sub> H <sub>1</sub> -H <sub>3</sub> H <sub>2</sub> -H <sub>1</sub>	A	H <sub>1</sub> - H <sub>3</sub>	X <sub>3</sub> - X <sub>1</sub>	$\frac{V_H \cdot \sqrt{3}}{V_x \cdot 2}$	Zy5	NO ACCESSIBLE NEUTRAL
				B	H <sub>2</sub> - H <sub>1</sub>	X <sub>1</sub> - X <sub>2</sub>			
				C	H <sub>3</sub> - H <sub>2</sub>	X <sub>2</sub> - X <sub>3</sub>			
35			—	A	H <sub>1</sub> - H <sub>0</sub>	X <sub>1</sub> - X <sub>3</sub>	$\frac{V_H}{V_x \cdot \sqrt{3}}$	ZNy11	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	H <sub>2</sub> - H <sub>0</sub>	X <sub>2</sub> - X <sub>1</sub>			
				C	H <sub>3</sub> - H <sub>0</sub>	X <sub>3</sub> - X <sub>2</sub>			
36			H <sub>3</sub> -H <sub>2</sub> H <sub>1</sub> -H <sub>3</sub> H <sub>2</sub> -H <sub>1</sub>	A	H <sub>1</sub> - H <sub>3</sub>	X <sub>1</sub> - X <sub>3</sub>	$\frac{V_H \cdot \sqrt{3}}{V_x \cdot 2}$	Zy11	NO ACCESSIBLE NEUTRAL
				B	H <sub>2</sub> - H <sub>1</sub>	X <sub>2</sub> - X <sub>1</sub>			
				C	H <sub>3</sub> - H <sub>2</sub>	X <sub>3</sub> - X <sub>2</sub>			
58			H <sub>1</sub> -H <sub>2</sub> X <sub>1</sub> -X <sub>2</sub>	A	H <sub>1</sub> - H <sub>2</sub>	X <sub>1</sub> - X <sub>2</sub>	$\frac{V_H}{V_x}$	T-T 0	
				B	H <sub>1</sub> - H <sub>3</sub>	X <sub>1</sub> - X <sub>3</sub>			
59			H <sub>2</sub> -H <sub>3</sub> X <sub>1</sub> -X <sub>2</sub>	A	H <sub>1</sub> - H <sub>3</sub>	X <sub>1</sub> - X <sub>2</sub>	$\frac{V_H \cdot \sqrt{3}}{V_x \cdot 2}$	T-T 30 Lag	
				B	H <sub>2</sub> - H <sub>3</sub>	X <sub>1</sub> - X <sub>3</sub>	$\frac{V_H \cdot 2}{V_x \cdot \sqrt{3}}$		
60			H <sub>2</sub> -H <sub>3</sub> X <sub>1</sub> -X <sub>3</sub>	A	H <sub>1</sub> - H <sub>3</sub>	X <sub>1</sub> - X <sub>3</sub>	$\frac{V_H \cdot \sqrt{3}}{V_x \cdot 2}$	T-T 30 Lead	
				B	H <sub>2</sub> - H <sub>3</sub>	X <sub>2</sub> - X <sub>1</sub>	$\frac{V_x \cdot 2}{V_H \cdot \sqrt{3}}$		



## CEI/IEC 60076-1 Transformer Descriptions

SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
1			—	A	1U – 1W	2W – 2U	$\frac{U_1}{U_2}$	Dd6	
				B	1V – 1U	2U – 2V			
				C	1W – 1V	2V – 2W			
37			—	A	1U – 1W	2U – 2W	$\frac{U_1}{U_2}$	Dd0	
				B	1V – 1U	2V – 2U			
				C	1W – 1V	2W – 2V			
38			—	A	1U – 1V	2W – 2V	$\frac{U_1}{U_2}$	Dd2	
				B	1V – 1W	2U – 2W			
				C	1W – 1U	2V – 2U			
39			—	A	1U – 1W	2W – 2U	$\frac{U_1}{U_2}$	Dd4	
				B	1V – 1U	2U – 2V			
				C	1W – 1U	2V – 2W			
40			—	A	1U – 1V	2V – 2W	$\frac{U_1}{U_2}$	Dd8	
				B	1V – 1W	2W – 2U			
				C	1W – 1U	2U – 2V			
41			—	A	1U – 1V	2U – 2W	$\frac{U_1}{U_2}$	Dd10	
				B	1V – 1W	2V – 2U			
				C	1W – 1U	2W – 2V			
42			—	A	1U – 1W	2U – 2N	$\frac{U_1 \cdot \sqrt{3}}{U_2}$	Dyn1	
				B	1V – 1U	2V – 2N			
				C	1W – 1V	2W – 2N			
2			1W – 1V	A	1U – 1W	2U – 2V	$\frac{U_1 \cdot \sqrt{3}}{U_2}$	Dy1	NO ACCESSIBLE NEUTRAL ON WYE WINDING
			1U – 1W	B	1V – 1U	2V – 2W			
			1V – 1U	C	1W – 1V	2W – 2U			
61			1W – 1V	A	1U – 1W	2U – 2V	$\frac{V_{U1} \cdot \sqrt{3}}{U_2}$	Dy3	NO ACCESSIBLE NEUTRAL ON WYE WINDING
			1U – 1W	B	1V – 1U	2V – 2W			
			1V – 1U	C	1W – 1V	2W – 2U			
62			—	A	1U – 1W	2N – 2V	$\frac{U_1 \cdot \sqrt{3}}{U_2}$	Dyn3	
				B	1V – 1U	2N – 2W			
				C	1W – 1V	2N – 2U			

SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
3			—	A	1U-1W	2W-2N	$\frac{U_1 \cdot \sqrt{3}}{U_2}$	Dyn5	
				B	1V-1U	2U-2N			
				C	1W-1V	2V-2N			
4			1W-1V 1U-1W 1V-1U	A	1U-1W	2W-2V	$\frac{U_1 \cdot \sqrt{3}}{U_2}$	Dy5	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	1V-1U	2U-2W			
				C	1W-1V	2V-2U			
5			—	A	1U-1W	2N-2U	$\frac{U_1 \cdot \sqrt{3}}{U_2}$	Dyn7	
				B	1V-1U	2N-2V			
				C	1W-1V	2N-2W			
6			1W-1V 1U-1W 1V-1U	A	1U-1W	2W-2U	$\frac{U_1 \cdot \sqrt{3}}{U_2}$	Dy7	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	1V-1U	2U-2V			
				C	1W-1V	2V-2W			
63			1W-1V 1U-1W 1V-1U	A	1U-1W	2V-2U	$\frac{U_1 \cdot \sqrt{3}}{U_2}$	Dy9	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	1V-1U	2W-2V			
				C	1W-1V	2U-2W			
64			—	A	1U-1W	2V-2N	$\frac{U_1 \cdot \sqrt{3}}{U_2}$	Dyn9	
				B	1V-1U	2W-2N			
				C	1W-1V	2U-2N			
7			—	A	1U-1W	2N-2W	$\frac{U_1 \cdot \sqrt{3}}{U_2}$	Dyn11	
				B	1V-1U	2N-2U			
				C	1W-1V	2N-2V			
8			1W-1V 1U-1W 1V-1U	A	1U-1W	2V-2W	$\frac{U_1 \cdot \sqrt{3}}{U_2}$	Dy11	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	1V-1U	2W-2U			
				C	1W-1V	2U-2V			
45			1V-1W 1W-1U 1U-1V	A	1U-1V	2U-2N	$\frac{3}{2} \cdot \frac{U_1}{U_2}$	Dzn0	
				B	1V-1W	2V-2N			
				C	1W-1U	2W-2N			
46			1V-1W 1W-1U 1U-1V	A	1U-1V	2N-2V	$\frac{3}{2} \cdot \frac{U_1}{U_2}$	Dzn2	
				B	1V-1W	2N-2W			
				C	1W-1U	2N-2U			

SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
47			—	A	1U – 1V	2W – 2V	$\frac{U_1}{U_2}$	Dz2	NO ACCESSIBLE NEUTRAL
				B	1V – 1W	2U – 2W			
				C	1W – 1U	2V – 2U			
48			1V-1W 1W-1U 1U-1V	A	1U – 1V	2W – 2N	$\frac{3}{2} \cdot \frac{U_1}{U_2}$	Dzn4	
				B	1V – 1W	2U – 2N			
				C	1W – 1U	2V – 2N			
49			—	A	1U – 1V	2W – 2U	$\frac{U_1}{U_2}$	Dz4	NO ACCESSIBLE NEUTRAL
				B	1V – 1W	2U – 2V			
				C	1W – 1U	2V – 2W			
9			—	A	1U – 1W	2U – 2W	$\frac{U_1}{U_2}$	Dz0	NO ACCESSIBLE NEUTRAL
				B	1V – 1U	2V – 2U			
				C	1W – 1V	2W – 2V			
10			—	A	1U – 1W	2W – 2U	$\frac{U_1}{U_2}$	Dz6	NO ACCESSIBLE NEUTRAL
				B	1V – 1U	2U – 2V			
				C	1W – 1V	2V – 2W			
50			1V-1W 1W-1U 1U-1V	A	1U – 1V	2N – 2U	$\frac{3}{2} \cdot \frac{U_1}{U_2}$	Dzn6	
				B	1V – 1W	2N – 2V			
				C	1W – 1U	2N – 2W			
51			1V-1W 1W-1U 1U-1V	A	1U – 1V	2V – 2N	$\frac{3}{2} \cdot \frac{U_1}{U_2}$	Dzn8	
				B	1V – 1W	2W – 2N			
				C	1W – 1U	2U – 2N			
52			—	A	1U – 1V	2V – 2W	$\frac{U_1}{U_2}$	Dz8	NO ACCESSIBLE NEUTRAL
				B	1V – 1W	2W – 2U			
				C	1W – 1U	2U – 2V			
53			1V-1W 1W-1U 1U-1V	A	1U – 1V	2N – 2W	$\frac{3}{2} \cdot \frac{U_1}{U_2}$	Dzn10	
				B	1V – 1W	2N – 2U			
				C	1W – 1U	2N – 2V			
54			—	A	1U – 1V	2U – 2W	$\frac{U_1}{U_2}$	Dz10	NO ACCESSIBLE NEUTRAL
				B	1V – 1W	2V – 2U			
				C	1W – 1U	2W – 2V			

SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
11			—	A	1U – 1N	2V – 2U	$\frac{U_1}{U_2 \cdot \sqrt{3}}$	YNd7	
				B	1V – 1N	2W – 2V			
				C	1W – 1N	2U – 2W			
44			—	A	1U – 1N	2U – 2V	$\frac{U_1}{U_2 \cdot \sqrt{3}}$	YNd1	
				B	1V – 1N	2V – 2W			
				C	1W – 1N	2W – 2U			
12			1W-1V	A	1U – 1W	2U – 2V	$\frac{U_1 \cdot \sqrt{3}}{U_2 \cdot 2}$	Yd1	NO ACCESSIBLE NEUTRAL ON WYE WINDING
			1U-1W	B	1V – 1U	2V – 2W			
			1V-1U	C	1W – 1V	2W – 2U			
13			—	A	1U – 1N	2W – 2U	$\frac{U_1}{U_2 \cdot \sqrt{3}}$	YNd5	
				B	1V – 1N	2U – 2V			
				C	1W – 1N	2V – 2W			
14			1W-1V	A	1U – 1W	2W – 2U	$\frac{U_1 \cdot \sqrt{3}}{U_2 \cdot 2}$	Yd5	NO ACCESSIBLE NEUTRAL ON WYE WINDING
			1U-1W	B	1V – 1U	2U – 2V			
			1V-1U	C	1W – 1V	2V – 2W			
15			1W-1V	A	1U – 1W	2V – 2U	$\frac{U_1 \cdot \sqrt{3}}{U_2 \cdot 2}$	Yd7	NO ACCESSIBLE NEUTRAL ON WYE WINDING
			1U-1W	B	1V – 1U	2W – 2V			
			1V-1U	C	1W – 1V	2U – 2W			
16			—	A	1U – 1N	2U – 2W	$\frac{U_1}{U_2 \cdot \sqrt{3}}$	YNd11	
				B	1V – 1N	2V – 2U			
				C	1W – 1N	2W – 2V			
17			1W-1V	A	1U – 1W	2U – 2W	$\frac{U_1 \cdot \sqrt{3}}{U_2 \cdot 2}$	Yd11	NO ACCESSIBLE NEUTRAL ON WYE WINDING
			1U-1W	B	1V – 1U	2V – 2U			
			1V-1U	C	1W – 1V	2W – 2V			
18			—	A	1U – 1N	2N – 2U	$\frac{U_1}{U_2}$	YNyn6	
				B	1V – 1N	2N – 2V			
				C	1W – 1N	2N – 2W			
19			1V-1N	A	1U – 1N	2U – 2V	$\frac{U_1}{U_2}$	YNy0	NO ACCESSIBLE NEUTRAL ON LOW VOLTAGE WINDING
			1W-1N	B	1V – 1N	2V – 2W			
			1U-1N	C	1W – 1N	2W – 2U			

SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
20			2W-2N 2U-2N 2V-2N	A	1U - 1W	2U - 2N	$\frac{U_1}{U_2}$	Yyn0	NO ACCESSIBLE NEUTRAL ON HIGH VOLTAGE WINDING
				B	1V - 1U	2V - 2N			
				C	1W - 1V	2W - 2N			
43			—	A	1U - 1N	2U - 2W	$\frac{U_1}{U_2}$	YNyn0	
				B	1V - 1N	2V - 2N			
				C	1W - 1N	2W - 2N			
21			—	A	1U - 1W	2U - 2W	$\frac{U_1}{U_2}$	Yy0	NO ACCESSIBLE NEUTRAL
				B	1V - 1U	2V - 2U			
				C	1W - 1V	2W - 2V			
22			1V-1N 1W-1N 1U-1N	A	1U - 1N	2V - 2U	$\frac{U_1}{U_2}$	YNy6	NO ACCESSIBLE NEUTRAL ON LOW VOLTAGE WINDING
				B	1V - 1N	2W - 2V			
				C	1W - 1N	2U - 2W			
23			2W-2N 2U-2N 2V-2N	A	1U - 1W	2N - 2U	$\frac{U_1}{U_2}$	Yyn6	NO ACCESSIBLE NEUTRAL ON HIGH VOLTAGE WINDING
				B	1V - 1U	2N - 2V			
				C	1W - 1V	2N - 2W			
24			—	A	1U - 1W	2W - 2U	$\frac{U_1}{U_2}$	Yy6	NO ACCESSIBLE NEUTRAL
				B	1V - 1U	2U - 2V			
				C	1W - 1V	2V - 2W			
65			—	A	1U - 1W	2U - 2N	$\frac{V_H \cdot \sqrt{3}}{V_X}$	YNzn1	
				B	1V - 1U	2V - 2N			
				C	1W - 1V	2W - 2N			
25			—	A	1U - 1W	2U - 2N	$\frac{U_1 \cdot \sqrt{3}}{U_2}$	Yzn1	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	1V - 1U	2V - 2N			
				C	1W - 1V	2W - 2N			
26			1W-1V 1U-1W 1V-1U	A	1U - 1W	2U - 2V	$\frac{U_1 \cdot \sqrt{3}}{U_2 \cdot 2}$	Yz1	NO ACCESSIBLE NEUTRAL
				B	1V - 1U	2V - 2W			
				C	1W - 1V	2W - 2U			
27			—	A	1U - 1W	2W - 2N	$\frac{U_1 \cdot \sqrt{3}}{U_2}$	Yzn5	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	1V - 1U	2U - 2N			
				C	1W - 1V	2V - 2N			

SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
28			1W-1V 1U-1W 1V-1U	A	1U - 1W	2W - 2U	$\frac{U_1 \cdot \sqrt{3}}{U_2 \cdot 2}$	Yz5	NO ACCESSIBLE NEUTRAL
				B	1V - 1U	2U - 2V			
				C	1W - 1V	2V - 2W			
66			—	A	1U - 1W	2N - 2U	$\frac{V_H \cdot \sqrt{3}}{V_X}$	YNzn7	
				B	1V - 1U	2N - 2V			
				C	1W - 1V	2N - 2W			
29			—	A	1U - 1W	2N - 2U	$\frac{U_1 \cdot \sqrt{3}}{U_2}$	Yzn7	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	1V - 1U	2N - 2V			
				C	1W - 1V	2N - 2W			
30			1W-1V 1U-1W 1V-1U	A	1U - 1W	2V - 2U	$\frac{U_1 \cdot \sqrt{3}}{U_2 \cdot 2}$	Yz7	NO ACCESSIBLE NEUTRAL
				B	1V - 1U	2W - 2V			
				C	1W - 1V	2U - 2W			
67			—	A	1U - 1W	2N - 2W	$\frac{V_H \cdot \sqrt{3}}{V_X}$	YNzn11	
				B	1V - 1U	2N - 2U			
				C	1W - 1V	2N - 2V			
31			—	A	1U - 1W	2N - 2W	$\frac{U_1 \cdot \sqrt{3}}{U_2}$	Yzn11	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	1V - 1U	2N - 2U			
				C	1W - 1V	2N - 2V			
32			1W-1V 1U-1W 1V-1U	A	1U - 1W	2U - 2W	$\frac{U_1 \cdot \sqrt{3}}{U_2 \cdot 2}$	Yz11	NO ACCESSIBLE NEUTRAL
				B	1V - 1U	2V - 2U			
				C	1W - 1V	2W - 2V			
55			1V-1W 1W-1U 1U-1V	A	1U - 1N	2U - 2V	$\frac{2}{3} \cdot \frac{U_1}{U_2}$	ZNd0	
				B	1V - 1N	2V - 2W			
				C	1W - 1N	2W - 2U			
56			—	A	1U - 1V	2U - 2V	$\frac{U_1}{U_2}$	Zd0	NO ACCESSIBLE NEUTRAL ON HIGH VOLTAGE
				B	1V - 1W	2V - 2W			
				C	1W - 1U	2W - 2U			
57			1V-1W 1W-1U 1U-1V	A	1U - 1N	2V - 2U	$\frac{2}{3} \cdot \frac{U_1}{U_2}$	ZNd6	
				B	1V - 1N	2W - 2V			
				C	1W - 1N	2U - 2W			

SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
33		—	A	1U - 1N	2W - 2U	$\frac{U_1}{U_2 \cdot \sqrt{3}}$	ZNy5	NO ACCESSIBLE NEUTRAL ON WYE WINDING	
			B	1V - 1N	2U - 2V				
			C	1W - 1N	2V - 2W				
34		1W-1V 1U-1W 1V-1U	A	1U - 1W	2W - 2U	$\frac{U_1}{U_2} \cdot \frac{\sqrt{3}}{2}$	Zy5	NO ACCESSIBLE NEUTRAL	
			B	1V - 1U	2U - 2V				
			C	1W - 1V	2V - 2W				
35		—	A	1U - 1N	2U - 2W	$\frac{U_1}{U_2 \cdot \sqrt{3}}$	ZNy11	NO ACCESSIBLE NEUTRAL ON WYE WINDING	
			B	1V - 1N	2V - 2U				
			C	1W - 1N	2W - 2V				
36		1W-1V 1U-1W 1V-1U	A	1U - 1W	2U - 2W	$\frac{U_1}{U_2} \cdot \frac{\sqrt{3}}{2}$	Zy11	NO ACCESSIBLE NEUTRAL	
			B	1V - 1U	2V - 2U				
			C	1W - 1V	2W - 2V				
58		—	A	1U - 1V	2U - 2V	$\frac{U_1}{U_2}$	T-T 0		
			B	1U - 1W	2U - 2W				
59		1V-1W 2U-2V	A	1U - 1W	2U - 2V	$\frac{U_1}{U_2} \cdot \frac{\sqrt{3}}{2}$	T-T 30 Lag		
			B	1V - 1W	2U - 2W	$\frac{U_1}{U_2} \cdot \frac{2}{\sqrt{3}}$			
60		1V-1W 2U-2W	A	1U - 1W	2U - 2W	$\frac{U_1}{U_2} \cdot \frac{\sqrt{3}}{2}$	T-T 30 Lead		
			B	1V - 1W	2V - 2U	$\frac{U_1}{U_2} \cdot \frac{2}{\sqrt{3}}$			

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SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
1			—	A	A-C	c-a	$\frac{HV}{LV}$	Dd6	
				B	B-A	a-b			
				C	C-B	b-c			
37			—	A	A-C	a-c	$\frac{HV}{LV}$	Dd0	
				B	B-A	b-a			
				C	C-B	c-b			
38			—	A	A-B	c-b	$\frac{HV}{LV}$	Dd2	
				B	B-C	a-c			
				C	C-A	b-a			
39			—	A	A-B	c-a	$\frac{HV}{LV}$	Dd4	
				B	B-C	a-b			
				C	C-A	b-c			
40			—	A	A-B	b-c	$\frac{HV}{LV}$	Dd8	
				B	B-C	c-a			
				C	C-A	a-b			
41			—	A	A-B	a-c	$\frac{HV}{LV}$	Dd10	
				B	B-C	b-a			
				C	C-A	c-b			
42			—	A	A-C	a-η	$\frac{HV \cdot \sqrt{3}}{LV}$	Dyn1	
				B	B-A	b-η			
				C	C-B	c-η			
2			C-B A-C B-A	A	A-C	a-c	$\frac{HV \cdot \sqrt{3}}{LV}$	Dy1	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	B-A	b-a			
				C	C-B	c-b			
61			C-B A-C B-A	A	A-C	a-b	$\frac{V_H \cdot \sqrt{3}}{V_x}$	Dy3	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	B-A	b-c			
				C	C-B	c-a			
62			—	A	A-C	η-b	$\frac{HV \cdot \sqrt{3}}{LV}$	Dyn3	
				B	B-A	η-c			
				C	C-B	η-a			



SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
3			—	A	A-C	c-η	$\frac{HV \cdot \sqrt{3}}{LV}$	Dyn5	
				B	B-A	a-η			
				C	C-B	b-η			
4			C-B A-C B-A	A	A-C	c-b	$\frac{HV \cdot \sqrt{3}}{LV}$	Dy5	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	B-A	a-c			
				C	C-B	b-a			
5			—	A	A-C	η-a	$\frac{HV \cdot \sqrt{3}}{LV}$	Dyn7	
				B	B-A	η-b			
				C	C-B	η-c			
6			C-B A-C B-A	A	A-C	c-a	$\frac{HV \cdot \sqrt{3}}{LV}$	Dy7	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	B-A	a-b			
				C	C-B	b-c			
63			C-B A-C B-A	A	B-C	b-a	$\frac{HV \cdot \sqrt{3}}{LV}$	Dy9	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	B-A	c-b			
				C	C-B	a-c			
64			—	A	A-C	b-η	$\frac{HV \cdot \sqrt{3}}{LV}$	Dyn9	
				B	B-A	c-η			
				C	C-B	a-η			
7			—	A	A-C	η-c	$\frac{HV \cdot \sqrt{3}}{LV}$	Dyn11	
				B	B-A	η-a			
				C	C-B	η-b			
8			C-B A-C B-A	A	A-C	b-c	$\frac{HV \cdot \sqrt{3}}{LV}$	Dy11	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	B-A	c-a			
				C	C-B	a-b			
45			B-C C-A A-B	A	A-B	a-η	$\frac{3}{2} \cdot \frac{HV}{LV}$	Dzn0	
				B	B-C	b-η			
				C	C-A	c-η			
46			B-C C-A A-B	C	A-B	η-b	$\frac{3}{2} \cdot \frac{HV}{LV}$	Dzn2	
				A	B-C	η-c			
				B	C-A	η-a			

SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
47			—	A	A-B	c-b	$\frac{HV}{LV}$	Dz2	NO ACCESSIBLE NEUTRAL
				B	B-C	a-c			
				C	C-A	b-a			
48			B-C C-A A-B	A	A-B	c-η	$\frac{3}{2} \cdot \frac{HV}{LV}$	Dzn4	
				B	B-C	a-η			
				C	C-A	b-η			
49			—	A	A-B	c-a	$\frac{HV}{LV}$	Dz4	NO ACCESSIBLE NEUTRAL
				B	B-C	a-b			
				C	C-A	b-c			
9			—	A	A-C	a-c	$\frac{HV}{LV}$	Dz0	NO ACCESSIBLE NEUTRAL
				B	B-A	b-a			
				C	C-B	c-b			
10			—	A	A-C	c-a	$\frac{HV}{LV}$	Dz6	NO ACCESSIBLE NEUTRAL
				B	B-A	a-b			
				C	C-B	b-c			
50			B-C C-A A-B	A	A-B	η-a	$\frac{3}{2} \cdot \frac{HV}{LV}$	Dzn6	
				B	B-C	η-b			
				C	C-A	η-c			
51			B-C C-A A-B	A	A-B	b-η	$\frac{3}{2} \cdot \frac{HV}{LV}$	Dzn8	
				B	B-C	c-η			
				C	C-A	a-η			
52			—	A	A-B	b-c	$\frac{HV}{LV}$	Dz8	NO ACCESSIBLE NEUTRAL
				B	B-C	c-a			
				C	C-A	a-b			
53			B-C C-A A-B	A	A-B	η-c	$\frac{3}{2} \cdot \frac{HV}{LV}$	Dzn10	
				B	B-C	η-a			
				C	C-A	η-b			
54			—	A	A-B	a-c	$\frac{HV}{LV}$	Dz10	NO ACCESSIBLE NEUTRAL
				B	B-C	b-a			
				C	C-A	c-b			

SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
11			—	A	A - N	b - a	$\frac{HV}{LV \cdot \sqrt{3}}$	YNd7	
				B	B - N	c - b			
				C	C - N	a - c			
44			—	A	A - N	a - b	$\frac{HV}{LV \cdot \sqrt{3}}$	YNd1	
				B	B - N	b - c			
				C	C - N	c - a			
12			C - B	A	A - C	a - b	$\frac{HV \cdot \sqrt{3}}{LV \cdot 2}$	Yd1	NO ACCESSIBLE NEUTRAL ON WYE WINDING
			A - C	B	B - A	b - c			
			B - A	C	C - B	c - a			
13			—	A	A - N	c - a	$\frac{HV}{LV \cdot \sqrt{3}}$	YNd5	
				B	B - N	a - b			
				C	C - N	b - c			
14			C - B	A	A - C	c - a	$\frac{HV \cdot \sqrt{3}}{LV \cdot 2}$	Yd5	NO ACCESSIBLE NEUTRAL ON WYE WINDING
			A - C	B	B - A	a - b			
			B - A	C	C - B	b - c			
15			C - B	A	A - C	b - a	$\frac{HV \cdot \sqrt{3}}{LV \cdot 2}$	Yd7	NO ACCESSIBLE NEUTRAL ON WYE WINDING
			A - C	B	B - A	c - b			
			B - A	C	C - B	a - c			
16			—	A	A - N	a - c	$\frac{HV}{LV \cdot \sqrt{3}}$	YNd11	
				B	B - N	b - a			
				C	C - N	c - b			
17			C - B	A	A - C	a - c	$\frac{HV \cdot \sqrt{3}}{LV \cdot 2}$	Yd11	NO ACCESSIBLE NEUTRAL ON WYE WINDING
			A - C	B	B - A	b - a			
			B - A	C	C - B	c - b			
18			—	A	A - N	η - a	$\frac{HV}{LV}$	YNyn6	
				B	B - N	η - b			
				C	C - N	η - c			
19			B - N	A	A - N	a - b	$\frac{HV}{LV}$	YNy0	NO ACCESSIBLE NEUTRAL ON LOW VOLTAGE WINDING
			C - N	B	B - N	b - c			
			A - N	C	C - N	c - a			

SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
20			c-h a-h b-h	A	A-C	a-η	$\frac{HV}{LV}$	Yyn0	NO ACCESSIBLE NEUTRAL ON HIGH VOLTAGE WINDING
				B	B-C	b-η			
				C	C-B	c-η			
43			—	A	A-N	a-η	$\frac{HV}{LV}$	YNyn0	
				B	B-N	b-η			
				C	C-N	c-η			
21			—	A	A-C	a-c	$\frac{HV}{LV}$	Yy0	NO ACCESSIBLE NEUTRAL
				B	B-A	b-a			
				C	C-B	c-b			
22			B-N C-N A-N	A	A-N	b-a	$\frac{HV}{LV}$	YNy6	NO ACCESSIBLE NEUTRAL ON LOW VOLTAGE WINDING
				B	B-N	c-b			
				C	C-N	a-c			
23			c-h a-h b-h	A	A-C	η-a	$\frac{HV}{LV}$	Yyn6	NO ACCESSIBLE NEUTRAL ON HIGH VOLTAGE WINDING
				B	B-A	η-b			
				C	C-B	η-c			
24			—	A	A-C	c-a	$\frac{HV}{LV}$	Yy6	NO ACCESSIBLE NEUTRAL
				B	B-A	a-b			
				C	C-B	b-c			
65			—	A	A-C	a-η	$\frac{V_H \cdot \sqrt{3}}{V_x}$	YNzn1	
				B	B-A	b-η			
				C	C-B	c-η			
25			—	A	A-C	a-η	$\frac{V_H \cdot \sqrt{3}}{LV}$	Yzn1	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	B-A	b-η			
				C	C-B	c-η			
26			C-B A-C B-A	A	A-C	a-b	$\frac{HV \cdot \sqrt{3}}{LV \cdot 2}$	Yz1	NO ACCESSIBLE NEUTRAL
				B	B-A	b-c			
				C	C-B	c-a			
27			—	A	A-C	c-η	$\frac{HV \cdot \sqrt{3}}{LV}$	Yzn5	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	B-A	a-η			
				C	C-B	b-η			

SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
28			C-B A-C B-A	A	A-C	c-a	$\frac{HV \cdot \sqrt{3}}{LV \cdot 2}$	Yz5	NO ACCESSIBLE NEUTRAL
				B	B-A	a-b			
				C	C-B	b-c			
66			—	A	A-C	$\eta$ -a	$\frac{V_H \cdot \sqrt{3}}{V_X}$	YNzn7	
				B	B-A	$\eta$ -b			
				C	C-B	$\eta$ -c			
29			—	A	A-C	$\eta$ -a	$\frac{HV \cdot \sqrt{3}}{LV}$	Yzn7	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	B-A	$\eta$ -b			
				C	C-B	$\eta$ -c			
30			C-B A-C B-A	A	A-C	b-a	$\frac{HV \cdot \sqrt{3}}{LV \cdot 2}$	Yz7	NO ACCESSIBLE NEUTRAL
				B	B-A	c-b			
				C	C-B	a-c			
67			—	A	A-C	$\eta$ -c	$\frac{V_H \cdot \sqrt{3}}{V_X}$	Yzn11	
				B	B-A	$\eta$ -a			
				C	C-B	$\eta$ -b			
31			—	A	A-C	$\eta$ -c	$\frac{HV \cdot \sqrt{3}}{LV}$	Yz11	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	B-A	$\eta$ -a			
				C	C-B	$\eta$ -b			
32			C-B A-C B-A	A	A-C	a-c	$\frac{HV \cdot \sqrt{3}}{LV \cdot 2}$	Yz11	NO ACCESSIBLE NEUTRAL
				B	B-A	b-a			
				C	C-B	c-b			
55			b-c c-a a-b	A	A-N	a-b	$\frac{2}{3} \cdot \frac{HV}{LV}$	ZNd0	
				B	B-N	b-c			
				C	C-N	c-a			
56			—	A	A-B	a-b	$\frac{HV}{LV}$	Zd0	NO ACCESSIBLE NEUTRAL ON HIGH VOLTAGE
				B	B-C	b-c			
				C	C-A	c-a			
57			b-c c-a a-b	A	A-N	b-a	$\frac{HV}{LV}$	ZNd6	
				B	B-N	c-b			
				C	C-N	a-c			

SPEC TEST NO.	TRANSFORMER CONFIGURATION		EXT. JUMPER	PHASE	WINDING TESTED		CAL. TURN RATIO	VECTOR GROUP	NOTES
	HIGH-VOLTAGE WINDING (H)	LOW-VOLTAGE WINDING (X)			HIGH VOLTAGE WINDING	LOW VOLTAGE WINDING			
28			C-B A-C B-A	A	A-C	c-a	$\frac{HV \cdot \sqrt{3}}{LV \cdot 2}$	Yz5	NO ACCESSIBLE NEUTRAL
				B	B-A	a-b			
				C	C-B	b-c			
66			—	A	A-C	η-a	$\frac{V_H \cdot \sqrt{3}}{V_X}$	YNzn7	
				B	B-A	η-b			
				C	C-B	η-c			
29			—	A	A-C	η-a	$\frac{HV \cdot \sqrt{3}}{LV}$	Yzn7	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	B-A	η-b			
				C	C-B	η-c			
30			C-B A-C B-A	A	A-C	b-a	$\frac{HV \cdot \sqrt{3}}{LV \cdot 2}$	Yz7	NO ACCESSIBLE NEUTRAL
				B	B-A	c-b			
				C	C-B	a-c			
67			—	A	A-C	η-c	$\frac{V_H \cdot \sqrt{3}}{V_X}$	Yzn11	
				B	B-A	η-a			
				C	C-B	η-b			
31			—	A	A-C	η-c	$\frac{HV \cdot \sqrt{3}}{LV}$	Yz11	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	B-A	η-a			
				C	C-B	η-b			
32			C-B A-C B-A	A	A-C	a-c	$\frac{HV \cdot \sqrt{3}}{LV \cdot 2}$	Yz11	NO ACCESSIBLE NEUTRAL
				B	B-A	b-a			
				C	C-B	c-b			
55			b-c c-a a-b	A	A-N	a-b	$\frac{2}{3} \cdot \frac{HV}{LV}$	ZNd0	
				B	B-N	b-c			
				C	C-N	c-a			
56			—	A	A-B	a-b	$\frac{HV}{LV}$	Zd0	NO ACCESSIBLE NEUTRAL ON HIGH VOLTAGE
				B	B-C	b-c			
				C	C-A	c-a			
57			b-c c-a a-b	A	A-N	b-a	$\frac{HV}{LV}$	ZNd6	
				B	B-N	c-b			
				C	C-N	a-c			