

## CEI/IEC 60076-1 Transformer Descriptions

SPEC TEST NO.	TRANSFORMER CONFIGURATION		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 1U – 1W 1V – 1U	A	1U – 1W	2U – 2V	$\frac{U_1 \cdot \sqrt{3}}{U_2}$	Dy1	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	1V – 1U	2V – 2W			
				C	1W – 1V	2W – 2U			
61			1W – 1V 1U – 1W 1V – 1U	A	1U – 1W	2U – 2V	$\frac{V_{U1} \cdot \sqrt{3}}{U_2}$	Dy3	NO ACCESSIBLE NEUTRAL ON WYE WINDING
				B	1V – 1U	2V – 2W			
				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			

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	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			

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## CEI/IEC 60076-1 Transformer Descriptions

SPEC TEST NO.	TRANSFORMER CONFIGURATION		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	A	1U – 1V	2W – 2N	$\frac{3}{2} \cdot \frac{U_1}{U_2}$	Dzn4	
			1W-1U	B	1V – 1W	2U – 2N			
			1U-1V	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	A	1U – 1V	2N – 2U	$\frac{3}{2} \cdot \frac{U_1}{U_2}$	Dzn6	
			1W-1U	B	1V – 1W	2N – 2V			
			1U-1V	C	1W – 1U	2N – 2W			
51			1V-1W	A	1U – 1V	2V – 2N	$\frac{3}{2} \cdot \frac{U_1}{U_2}$	Dzn8	
			1W-1U	B	1V – 1W	2W – 2N			
			1U-1V	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	A	1U – 1V	2N – 2W	$\frac{3}{2} \cdot \frac{U_1}{U_2}$	Dzn10	
			1W-1U	B	1V – 1W	2N – 2U			
			1U-1V	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			

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## CEI/IEC 60076-1 Transformer Descriptions

SPEC TEST NO.	TRANSFORMER CONFIGURATION		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			

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## CEI/IEC 60076-1 Transformer Descriptions

SPEC TEST NO.	TRANSFORMER CONFIGURATION		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			

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SPEC TEST NO.	TRANSFORMER CONFIGURATION		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			

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	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			