IEC 60076 vector group	Winding connection		Measurement	Trans-former high-voltage side	Trans-former low-voltage side	Measured turn ratio
	HV / H	LV /X				
	V/H2	v/X2	Α	U-V / H1-H2	u-v / X1-X2	1
Dd0	\wedge	\wedge	В	V-W / H2-H3	v-w / X2-X3	
Buo	U/H1 W/H3	u/X1 w/X3	С	W-U / H3-H1	w-u / X3-X1	
	V/H2	u/X1 v/X2	А	U-V / H1-H2	w-v / X3-X2	1
Dd2	\wedge		В	V-W / H2-H3	u-w / X1-X3	
542	U/H1 W/H3	w/X3	С	W-U / H3-H1	v-u / X2-X1	
	V/H2	u/X1	А	U-V / H1-H2	w-u / X3-X1	1
Dd4	\wedge	w/X3 v/X2	В	V-W / H2-H3	u-v / X1-X2	
Dui	U/H1 W/H3		С	W-U / H3-H1	v-w / X2-X3	
	V/H2		А	U-V / H1-H2	v-u / X2-X1	1
Dd6			В	V-W / H2-H3	w-v / X3-X2	
Duo	U/H1 W/H3		С	W-U / H3-H1	u-w / X1-X3	
	V/H2 U/H1 W/H3	H2 W/X3	А	U-V / H1-H2	v-w / X2-X3	1
Dd8			В	V-W / H2-H3	w-u / X3-X1	
		v/X2 u/X1	С	W-U / H3-H1	u-v / X1-X2	
	V/H2	v/X2 w/X3	А	U-V / H1-H2	u-w / X1-X3	1
Dd10	\land		В	V-W / H2-H3	v-u / X2-X1	
Dulo	U/H1 W/H3	u/X1	С	W-U / H3-H1	w-v / X3-X2	
	V/H2	v/X2	А	U-V / H1-H2	n-v / X0-X2	1*√3
Dyn1	\wedge	u/ <u>X1</u>	В	V-W / H2-H3	n-w / X0-X3	
Dyn1	U/H1 W/H3	w/X3	С	W-U / H3-H1	n-u / X0-X1	

IEC 60076 vector group	Winding connection		Measurement	Trans-former high-voltage side	Trans-former low-voltage side	Measured turn ratio
	HV / H	LV /X				
	V/H2	v/X2	А	U-(V+W) / H1-(H2+H3)	u-v / X1-X2	√3/2
Dy1		u/ <u>X1</u>	В	V-(U+W) / H2-(H1+H3)	v+w / X2-X3	
	U/H1 W/H3	w/X3	С	W-(U+V) / H3-(H1+H2)	w-u / X3-X1	
	V/H2	u/X1	А	U-V / H1-H2	w-n / X3-X0	1*√3
Dyn3	\land		В	V-W / H2-H3	u-n / X1-X0	
Dyns	U/H1 W/H3	v/X2 w/X3	С	W-U / H3-H1	v-n / X2-X0	
Dy3	V/H2	u/X1 v/X2 w/X3	А	U-(V+W) / H1- (H2+H3)	w-v / X3-X2	√3/2
	U/H1 W/H3		В	V-(U+W) / H2- (H1+H3)	u-w / X1-X3	
			С	W-(U+V) / H3- (H1+H2)	v-u / X2-X1	
	V/H2	w/X3 (v/X2	Α	U-V / H1-H2	n-u / X0-X1	1*√3
Dyn5			В	V-W / H2-H3	n-v / X0-X2	
Dynio .	U/H1 W/H3		С	W-U / H3-H1	n-w / X0-X3	
	V/H2	u/X1	А	U-(V+W) / H1- (H2+H3)	w-u / X3-X1	√3/2
Dy5		w/X3	В	V-(U+W) / H2- (H1+H3)	u-v / X1-X2	
	U/H1 W/H3	v/X2	С	W-(U+V) / H3- (H1+H2)	v-w / X2-X3	
	V/H2	w/X3	А	U-V / H1-H2	v-n/ X2-X0	√3
Dyn7		<u>u/</u> X1	В	V-W / H2-H3	w-n / X3-X0	
- J	U/H1 W/H3	v/X2 u/X1	С	W-U / H3-H1	u-n / X1-X0	

IEC 60076 vector group	Winding connection		Measurement	Trans-former high-voltage side	Trans-former low-voltage side	Measured turn ratio
	HV / H	LV /X				
	V/H2	w/X3	А	U-(V+W) / H1- (H2+H3)	v-u / X2-X1	1*√3/2
Dy7		<u>u/</u> X1	В	V-(U+W) / H2- (H1+H3)	w-v / X3-X2	
	U/H1 W/H3	v/X2	С	W-(U+V) / H3- (H1+H2)	u-w / X1-X3	
	V/H2	w/X3	А	U-V / H1-H2	n-w / X0-X3	√3
Dyn9	\wedge	v/X2 /	В	V-W / H2-H3	n-u / X0-X1	
Бупэ	U/H1 W/H3	u/X1	С	W-U / H3-H1	n-v / X0-X2	
	V/H2 U/H1 W/H3	v/X2 / w/X3 u/X1	А	U-(V+W) / H1-(H2+H3)	v-w / X2-X3	1*√3/2
Dy9			В	V-(U+W) / H2-(H1+H3)	w-u / X3-X1	
			С	W-(U+V) / H3-(H1+H2)	u-v / X1-X2	
	V/H2 U/H1 W/H3	v/X2 w/X3	А	U-V / H1-H2	u-n / X1-X0	√3
Dyn11			В	V-W / H2-H3	v-n / X2-X0	
<i>D</i> y			С	W-U / H3-H1	w-n / X3-X0	
	V/H2	v/X2 w/X3	А	U-(V+W) / H1- (H2+H3)	u-w / X1-X3	1*√3/2
Dy11			В	V-(U+W) / H2- (H1+H3)	v-u / X2-X1	
	U/H1 W/H3		С	W-(U+V) / H3- (H1+H2)	w-v / X3-X2	
_	V/H2	v/X2	А	U-(V+W) / H1- (H2+H3)	u-n / X1-X0	1.5
Dzn0		u/X1 W/X3	В	V-(U+W) / H2- (H1+H3)	v-n / X2-X0	
	U/H1 W/H3		С	W-(U+V) / H3- (H1+H2)	w-n / X3-X0	

IEC 60076 vector group	Winding connection		Measurement	Trans-former high-voltage side	Trans-former low-voltage side	Measure turn ratio
	HV / H	LV /X				
	V/H2	v/X2	Α	U-V / H1-H2	u-v / X1-X2	1
Dz0	\wedge		В	V-W / H2-H3	v-w / X2-X3	
D20	U/H1 W/H3	u/X1 w/X3	С	W-U / H3-H1	w-u / X3-X1	
	V/H2	u/X1 v/X2	А	U-(V+W) / H1- (H2+H3)	n-v / X0-X2	1.5
Dzn2		\rightarrow	В	V-(U+W) / H2- (H1+H3)	n-w / X0-X3	
	U/H1 W/H3	\ _{w/X3}	С	W-(U+V) / H3- (H1+H2)	n-u / X0-X1	
	V/H2	u/X1 v/X2	Α	U-V / H1-H2	w-v / X3-X2	1
Dz2			В	V-W / H2-H3	u-w / X1-X3	
DZZ	U/H1 W/H3		С	W-U / H3-H1	v-u / X2-X1	
Dzn4	V/H2	u/X1 w/X3 v/X2	А	U-(V+W) / H1- (H2+H3)	w-n / X3-X0	1.5
			В	V-(U+W) / H2- (H1+H3)	u-n / X1-X0	
	U/H1 W/H3		С	W-(U+V) / H3- (H1+H2)	v-n / X2-X0	
	V/H2	u/X1	Α	U-V / H1-H2	w-u / X3-X1	1
Dz4		w/X3 v/X2	В	V-W / H2-H3	u-v / X1-X2	
	U/H1 W/H3		С	W-U / H3-H1	v-w / X2-X3	
	V/H2	w <u>/X3</u> u/X1	А	U-(V+W) / H1- (H2+H3)	n-u / X0-X1	1.5
Dzn6		\rightarrow	В	V-(U+W) / H2- (H1+H3)	n-v / X0-X2	
	U/H1 W/H3		С	W-(U+V) / H3- (H1+H3)	n-w/ X0-X3	
Dz6	V/H2	w/X3 u/X1	А	U-V / H1-H2	v-u / X2-X1	1
		-	В	V-W / H2-H3	w-v / X3-X2	
	U/H1 W/H3	VX2	С	W-U / H3-H1	u-w / X1-X3	

IEC 60076 vector group	Winding connection		Measurement	Trans-former high-voltage side	Trans-former low-voltage side	Measured turn ratio
	HV / H	LV /X				
	V/H2	w/X3	А	U-(V+W) / H1- (H2+H3)	v-n / X2-X0	1.5
Dzn8		v/X2 u/X1	В	V-(U+W) / H2- (H1+H3)	w-n / X3-X0	
	U/H1 W/H3	V/A2	С	W-(U+V) / H3- (H1+H2)	u-n / X1-X0	
	V/H2	w/X3 \	А	U-V / H1-H2	v-w / X2-X3	1
Dz8	\wedge	\(\sigma_{\chi_1}\)	В	V-W / H2-H3	w-u / X3-X1	
520	U/H1 W/H3	v/X2 u/X1	С	W-U / H3-H1	u-v / X1-X2	
	V/H2 U/H1 W/H3	v/X2 w/X3	А	U-(V+W) / H1- (H2+H3)	n-w / X0-X3	1.5
Dzn10		w/X2 w/X3 u/X1	В	V-(U+W) / H2- (H1+H3)	n-u / X0-X1	
			С	W-(U+V) / H3- (H1+H2)	n-v / X0-X2	
	V/H2 U/H1 W/H3	v/X2 w/X3 u/X1	Α	U-V / H1-H2	u-w / X1-X3	1
Dz10			В	V-W / H2-H3	v-u / X2-X1	
			С	W-U / H3-H1	w-v / X3-X2	
	V/H2 U/H1 W/H3	v/X2 u/X1 w/X3	Α	U-N / H1-H0	u-n / X1-X0	1
YNyn0			В	V-N / H2-H0	v-n / X2-X0	
•			С	W-N / H3-H0	w-n / X3-X0	
	V/H2	v/X2	А	U-V / H1-H2	u-v / X1-X2	1
YNy0			В	V-W / H2-H3	v-w / X2-X3	
Tryo	U/H1 W/H3	u/X1 w/X3	С	W-U / H3-H1	w-u / X3-X1	
	V/H2	v/X2	А	U-V / H1-H2	u-v / X1-X2	1
Yyn0			В	V-W / H2-H3	v-w / X2-X3	
	U/H1 W/H3	u/X1 w/X3	С	W-U / H3-H1	w-u / X3-X1	

IEC 60076 vector group	Winding connection		Measurement	Trans-former high-voltage side	Trans-former low-voltage side	Measured turn ratio
	HV / H	LV /X				
	V/H2	v/X2	Α	U-V / H1-H2	u-v / X1-X2	1
Yy0			В	V-W / H2-H3	v-w / X2-X3	
,	U/H1 W/H3	u/X1 w/X3	С	W-U / H3-H1	w-u / X3-X1	
	V/H2	w/X3 u/X1	А	U-N / H1-H0	n-u / X0-X1	1
YNyn6		\	В	V-N / H2-H0	n-v / X0-X2	
,	U/H1 W/H3	v/X2	С	W-N / H3-H0	n-w / X0-X3	
	V/H2	w/X3 u/X1	Α	U-V / H1-H2	v-u / X2-X1	1
YNy6		\	В	V-W / H2-H3	w-v / X3-X2	
, 0	U/H1 W/H3	v/X2	С	W-U / H3-H1	u-w / X1-X3	
	V/H2	w/X3 u/X1 v/X2	Α	U-V / H1-H2	v-u / X2-X1	1
Yyn6			В	V-W / H2-H3	w-v / X3-X2	
. y	U/H1 W/H3		С	W-U / H3-H1	u-w / X1-X3	
	V/H2		Α	U-V / H1-H2	v-u / X2-X1	1
Yy6			В	V-W / H2-H3	w-v / X3-X2	
. , 0	U/H1 W/H3		С	W-U / H3-H1	u-w / X1-X3	
	V/H2	v/X2 u/X1 w/X3	Α	U-V / H1-H2	n-v / X0-X2	1*√3
Yzn1			В	V-W / H2-H3	n-w / X0-X3	
	U/H1 W/H3		С	W-U / H3-H1	n-u / X0-X1	
	V/H2	v/X2	А	U-(V+W) / H1- (H2+H3)	u-v / X1-X2	√3/2
Yz1		u/X1	В	V-(U+W) / H2- (H1+H3)	v-w / X2-X3	
	U/H1 W/H3	w/X3	С	W-(U+V) / H3- (H1+H2)	w-u / X3-X1	
	V/H2	w/X3 u/X1	А	U-V / H1-H2	n-u / X0-X1	1*√3
Yzn5			В	V-W / H2-H3	n-v / X0-X2	
	U/H1 W/H3	v/X2	С	W-U / H3-H1	n-w / X0-X3	

IEC 60076 vector group	Winding connection		Measurement	Trans-former high-voltage side	Trans-former low-voltage side	Measured turn ratio
	HV / H	LV /X				
	V/H2	w/X3 u/X1	А	U-(V+W) / H1- (H2+H3)	w-u / X3-X1	√3/2
Yz5	人	\sim	В	V-(U+W) / H2- (H1+H3)	u-v / X1-X2	
	U/H1 W/H3	v/X2	С	W-(U+V) / H3- (H1+H2)	v-w / X2-X3	
	V/H2	w/X3	А	U-V / H1-H2	v-n / X2-X0	√3
Yzn7		u/X1	В	V-W / H2-H3	w-n / X3-X0	
12117	U/H1 W/H3	v/X2	С	W-U / H3-H1	u-n / X1-X0	
	V/H2	w/X3 u/X1	A	U-(V+W) / H1- (H2+H3)	v-u / X2-X1	1*√3/2
Yz7			В	V-(U+W) / H2- (H1+H3)	w-v / X3-X2	
	U/H1 W/H3		С	W-(U+V) / H3- (H1+H2)	u-w / X1-X3	
	V/H2	v/X2 w/X3	Α	U-V / H1-H2	u-n / X1-X0	√3
Yzn11			В	V-W / H2-H3	v-n / X2-X0	
	U/H1 W/H3	u/X1	С	W-U / H3-H1	w-n / X3-X0	
	V/H2	v/X2 w/X3	А	U-(V+W) / H1- (H2+H3)	u-w / X1-X3	1*√3/2
Yz11			В	V-(U+W) / H2- (H1+H3)	v-u / X2-X1	
	U/H1 W/H3		С	W-(U+V) / H3- (H1+H2)	w-v / X3-X2	
	V/H2	v/X2	Α	U-N / H1-H0	u-v / X1-X2	1/√3
YNd1		u/X1	В	V-N / H2-H0	v-w / X2-X3	
YNd1	U/H1 W/H3	w/X3	С	W-N / H3-H0	w-u / X3-X1	

IEC 60076 vector group	Winding connection		Measurement	Trans-former high-voltage side	Trans-former low-voltage side	Measured turn ratio
	HV / H	LV /X				
	V/H2	v/X2	А	U-(V+W) / H1- (H2+H3)	u-v / X1-X2	√3/2
Yd1		u/X1	В	V-(U+W) / H2- (H1+H3)	v-w / X2-X3	
	U/H1 W/H3	w/x3	С	W-(U+V) / H3- (H1+H2)	w-u / X3-X1	
	V/H2	u/X1	А	U-N / H1-H0	w-v / X3-X2	1/√3
YNd3		v/X2	В	V-N / H2-H0	u-w / X1-X3	
11140	U/H1 W/H3	w/X3	С	W-N / H3-H0	v-u / X2-X1	
	V/H2 U/H1 W/H3	u/X1 v/X2 w/X3	А	U-(V+W) / H1- (H2+H3)	w-v / X3-X2	√3/2
Yd3			В	V-(U+W) / H2- (H1+H3)	u-w / X1-X3	
			С	W-(U+V) / H3- (H1+H2)	v-u / X2-X1	
	V/H2	w/X3	А	U-N / H1-H0	w-u / X3-X1	1/√3
YNd5			В	V-N / H2-H0	u-v / X1-X2	
	U/H1 W/H3		С	W-N / H3-H0	v-w / X2-X3	
	V/H2	w/X3 u/X1 v/X2	А	U-(V+W) / H1- (H2+H3)	w-u / X3-X1	√3/2
Yd5			В	V-(U+W) / H2- (H1+H3)	u-v / X1-X2	
	U/H1 W/H3		С	W-(U+V) / H3- (H1+H2)	v-w / X2-X3	
	V/H2	w/X3 u/X1	А	U-N / H1-H0	v-u / X2-X1	1/√3
YNd7			В	V-N / H2-H0	w-v / X3-X2	
	U/H1 W/H3	v/X2	С	W-N / H3-H0	u-w / X1-X3	

IEC 60076 vector group	Winding connection		Measurement	Trans-former high-voltage side	Trans-former low-voltage side	Measured turn ratio
	HV / H	LV /X				
	V/H2	w/X3 u/X1	А	U-(V+W) / H1- (H2+H3)	v-u / X2-X1	1*√3/2
Yd7			В	V-(U+W) / H2- (H1+H3)	w-v / X3-X2	
	U/H1 W/H3	v/X2	С	W-(U+V) / H3- (H1+H2)	u-w / X1-X3	
	V/H2	w/X3	А	U-N / H1-H0	v-w / X2-X3	1/√3
YNd9		v/X2	В	V-N / H2-H0	w-u / X3-X1	
	U/H1 W/H3	u/X1	С	W-N / H3-H0	u-v / X1-X2	
	V/H2 U/H1 W/H3	v/X2 w/X3 u/X1	А	U-(V+W) / H1-(H2+H3)	v-w / X2-X3	1*√3/2
Yd9			В	V-(U+W) / H2-(H1+H3)	w-u / X3-X1	
			С	W-(U+V) / H3-(H1+H2)	u-v / X1-X2	
	V/H2	v/X2	Α	U-N / H1-H0	u-w / X1-X3	1/√3
YNd11		w/X3 u/X1	В	V-N / H2-H0	v-u / X2-X1	
	U/H1 W/H3		С	W-N / H3-H0	w-v / X3-X2	
Yd11	V/H2	v/X2 w/X3 u/X1	А	U-(V+W) / H1- (H2+H3)	u-w / X1-X3	1*√3/2
	U/H1 W/H3		В	V-(U+W) / H2- (H1+H3)	v-u / X2-X1	
			С	W-(U+V) / H3- (H1+H2)	w-v / X3-X2	