CT ve PT Sarım Oranı

Kategory	**tester**
Bölüm	**Akım Trafosu Modülü**
Dil	**Türkçe**
Oluşturuldu	**2026-11-04**

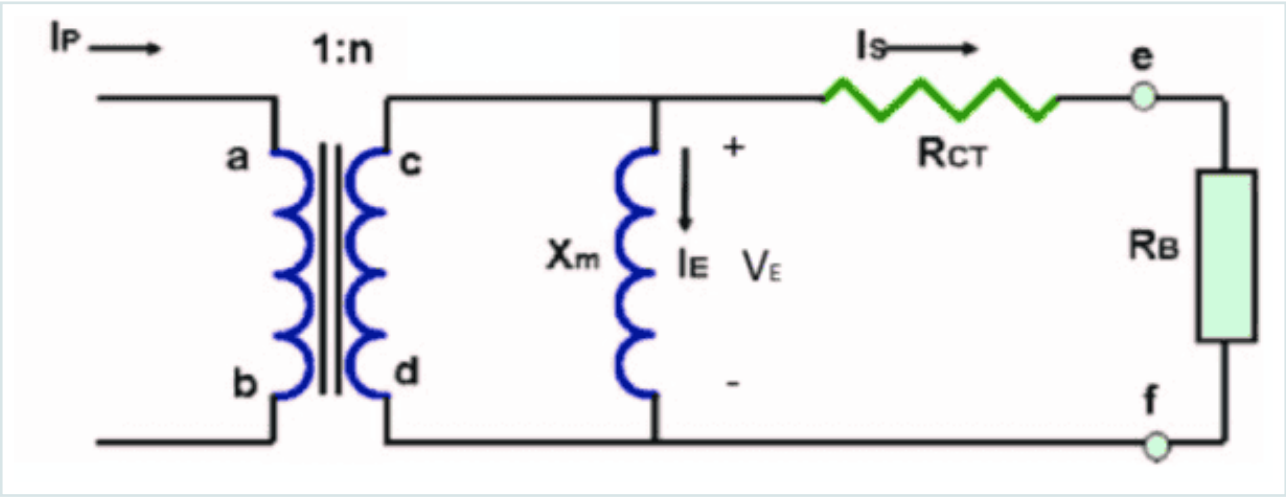
	Cores	Tap No.	Core Type	Class	Ipn	Isn	FS/ALF	Burden	Cos Phi	Rct Min	Rct max
▶ 1	1	S1 -S2	Metering	0.5	75.00 A	1.000 A	10.0000	5.000 VA	0.8000	2.000 Ω	2.100 Ω

Şekil 1

Error limits for measuring current transformers

Accuracy class	Ratio error ± % at current (% of rated)						Phase displacement ± Minutes at current (% of rated)					
	1	5	20	50	100	120	1	5	20	50	100	120
0.1	-	0.4	0.2	-	0.1	0.1	-	15	8	-	5	5
0.2	-	0.75	0.35	-	0.2	0.2	-	30	15	-	10	10
0.2S	0.75	0.35	0.2	-	0.2	0.2	30	15	10	-	10	10
0.5		1.5	0.75	-	0.5	0.5	-	90	45	-	30	30
0.5S	1.5	0.75	0.5	-	0.5	0.5	90	45	30	-	30	30
1	-	3	1.5	-	1	1	-	180	90	-	60	60
3	-	-	-	3	-	3	Not specified					
5	-	-	-	5	-	5	Not specified					

Şekil 2



Şekil 3

Nominal Burden = 5VA

Secondary Nominal Current = 1A

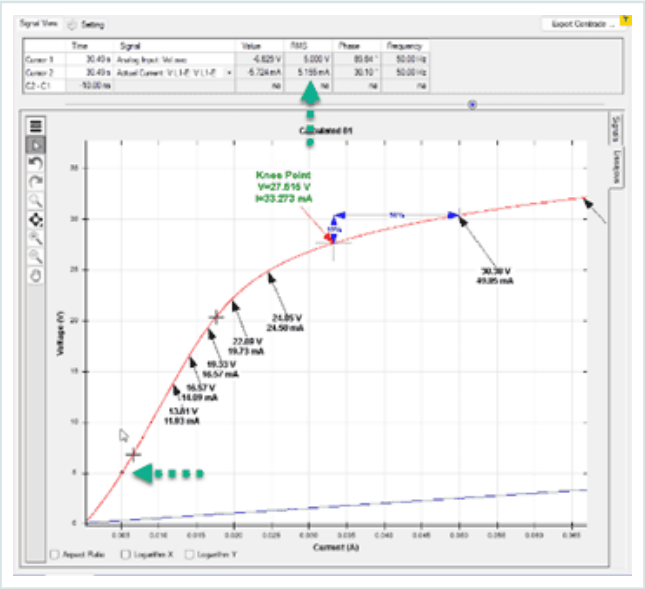
$$\text{Test Voltage} = \frac{5}{1} = 5v$$

$V_{test1} = 2.5v$

$V_{test2} = 5v$

$V_{test3} = 10v$

Şekil 4



Şekil 5

$$N_{turn} = 74.6255$$

$$\begin{cases} \%100 I_n = 1A \\ VA_n = 5VA \\ Z = \dfrac{VA}{I_n^2} = 5\Omega \end{cases}$$

$$V_E = Z * I = 5 * 1 = 5v$$

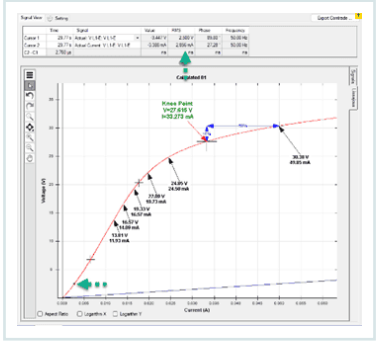
$$I_{E_Based\ on\ saturation\ curve} = 5.154mA$$

$$I_{T_InSecondary} = 1 + 0.005154 = 1.005154$$

$$I_{primary} = 74.6255 * 1.005154 = 75.0101$$

$$\text{Turns Ratio Error} = \left(\frac{75.0101}{75} - 1 \right) * 100 = 0.013\%$$

Şekil 6



Şekil 7

$$N_{turn} = 74.6255$$

$$\begin{cases} \%100I_n = 1A \\ 0.5*VA_n = 2.5VA \\ Z = \dfrac{0.5*VA_n}{I_n^{\,2}} = 2.5\Omega \end{cases}$$

$$V_E = Z * I = 2.5 * 1 = 2.5v$$

$$I_{E_Based\ on\ saturation\ curve} = 2.857mA$$

$$I_{T_InSecondary} = 1 + 0.002857 = 1.002857$$

$$I_{primary} = 74.6255 * 1.002857 = 74.8387$$

$$\text{Turns Ratio Error} = \left(\frac{74.8387}{75} - 1\right) * 100 = -0.215\%$$

Şekil 8

$$N_{turn} = 74.6255$$

$$\begin{cases} \%50I_n = 0.5A \\ 50\%VA_n = 2.5VA \\ Z = \dfrac{50\%VA_n}{I_n^{\,2}} = 2.5\Omega \end{cases}$$

$$V_E = Z * I = 2.5 * 0.5 = 1.25v$$

$$I_{E_Based\ on\ saturation\ curve} = 1.2825mA$$

$$I_{T_InSecondary} = 0.5 + 0.001282 = 0.501282$$

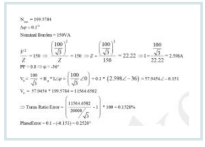
$$I_{primary} = 74.6255 * 0.50128 = 37.4084$$

$$\text{Turns Ratio Error} = \left(\frac{37.4084}{37.5} - 1\right) * 100 = -0.2442\%$$

Şekil 9

Core No.	Tap No.	Vprim.	Primary Factor	Vsec.	Secondary Factor	VA	CLP	CLM
1	1	20.00 kV	1/√3	100.0 V	1/√3	150.0 VA	3P	0.5

Şekil 10



Şekil 11

$$N_{tur} = 199.5784$$

$$\Delta\varphi = 0.1°$$

$$\text{Burden} = 75VA$$

$$\frac{\frac{100^2}{\sqrt{3}}}{Z} = 75 \Rightarrow \frac{\left(\frac{100}{\sqrt{3}}\right)^2}{75} = Z \Rightarrow Z = 44.444 \Rightarrow 44.444 * I^2 = 75 \Rightarrow I = 1.299A$$

$$PF = 0.8 \Rightarrow \varphi = -36°$$

$$V_E = \frac{100}{\sqrt{3}} + R_{pt} * I = \left(\frac{100}{\sqrt{3}} \angle 0\right) + 0.1 * (1.299 \angle -36) = 57.8401 \angle -0.0075$$

$$V_p = 57.8401 * 199.5784 = 11543.6346$$

$$\Rightarrow \text{Turns Ratio Error} = \left(\frac{11543.6346}{20000/\sqrt{3}} - 1\right) * 100 = -0.0292$$

$$\Rightarrow \text{Phase displacement} = 0.1 - (-0.0075) = -0.1075°$$

Şekil 12