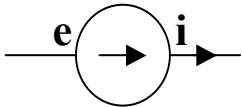
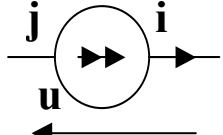


AHELA AKTIIVSED ELEMENDID (ALLIKAD)

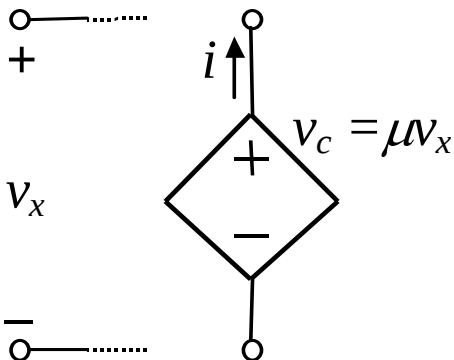
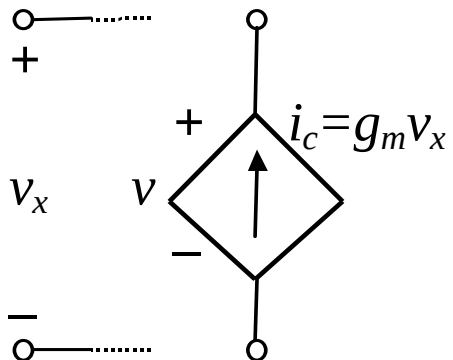
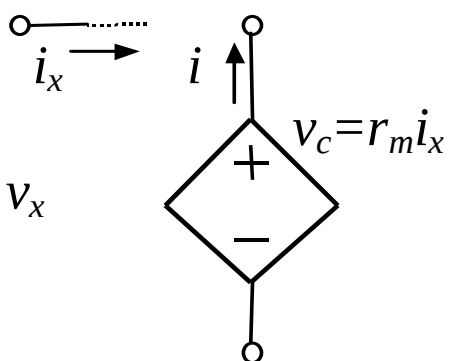
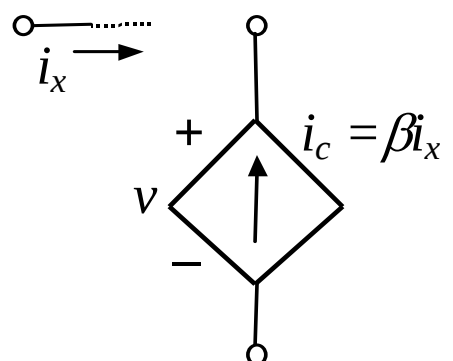
PINGEALLIKAS

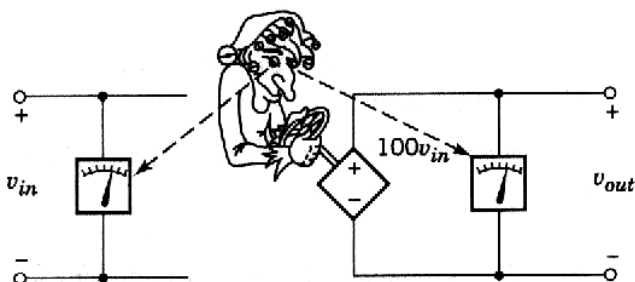
VOOLUALLIKAS

Sõltumatud allikad – ideaalsed allikad

pingeallikas $R_S = 0$ 	vooluallikas $R_S = \infty$ 
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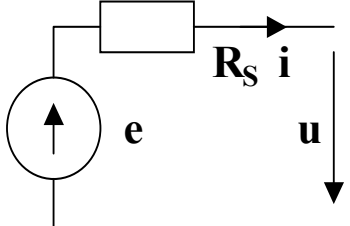
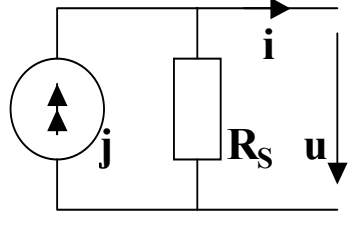
Sõltuvad e. juhitud e. tüüritavad allikad

Pingega juhitud (pingejuhitav)	
pingeallikas	vooluallikas
	
Vooluga juhitud (voolujuhitav)	
pingeallikas	vooluallikas
	

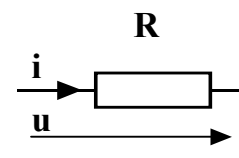
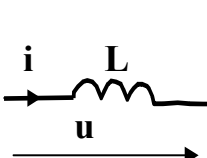
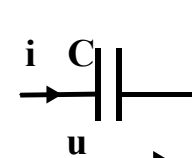
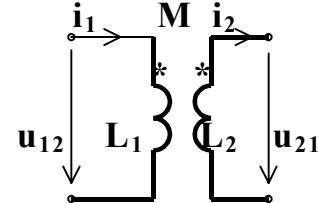
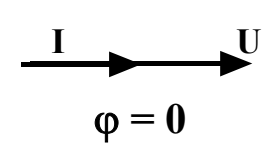
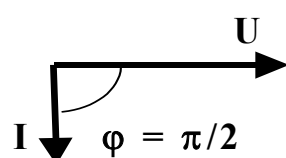
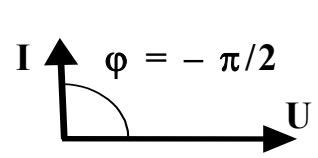


Juhitava allika (nt pinge-võimendi) interpreteerimine
 Juhib päkapikk (*gnome*), kes jälgib kahte voltmeetrit.

Reaalse (kadudega) allika aseskeemid

 $e = j R_s$	 $j = e/R_s$
Thévenini aseskeem	Nortoni aseskeem

PINGE JA VOOLU VAHELISED SEOSSED

Passiivsed elemendid R, L, C, M				
Pinge ja voolu hetkv.	$u = R i$ $i = G u$	$u = L di/dt$ $i = 1/L \int u dt$	$i = C du/dt$ $u = 1/C \int i dt$	$u_{12} = M di_2/dt$ $u_{21} = M di_1/dt$
Kompl.tak. ja juhtivus	$\underline{Z} = R$ $\underline{Y} = G$	$\underline{Z} = j \omega L$ $\underline{Y} = -j / \omega L$	$\underline{Z} = -j / \omega C$ $\underline{Y} = j \omega C$	$\underline{Z}_m = j \omega M$
Siinusrežiimil $u = \sqrt{2} U \sin(\omega t + \Psi_U)$ $i = \sqrt{2} I \sin(\omega t + \Psi_I)$ $\varphi = \Psi_U - \Psi_I$ Kompleksmeetod: $u = \text{Im}[\sqrt{2} \cdot \underline{U} \exp(j\omega t)]; \quad \underline{U} = U \angle \Psi_u = U \cos(\Psi_u) + j U \sin(\Psi_u); \quad \underline{U} = \underline{Z} \underline{I}$ $i = \text{Im}[\sqrt{2} \cdot \underline{I} \exp(j\omega t)]; \quad \underline{I} = I \angle \Psi_i = I \cos(\Psi_i) + j I \sin(\Psi_i); \quad \underline{I} = \underline{Y} \underline{U}$				
Efektiivväärtused	$U = R I$	$U = \omega L I$	$I = \omega C U$	
Vektor-diagramm				

R – aktiivtakistus; $X_L = \omega L$, $X_C = 1/\omega C$ – induktiivne ja mahtuvuslik reaktiivtakistus

G – aktiivjuhtivus; $B_L = 1/\omega L$, $B_C = \omega C$ – induktiivne ja mahtuvuslik reaktiivjuhtivus

Komplekstakistus $\underline{Z} = R + jX$; **kompleksjuhtivus** $\underline{Y} = G - jB$; $\underline{Z} = 1/\underline{Y}$

RLC jadaühendus: $Z = \sqrt{R^2 + X^2}$; $X = X_L - X_C$

RLC rööpühendus: $Y = \sqrt{G^2 + B^2}$; $B = B_L - B_C$

Z, X – näiv- ja reaktiivtakistus, Y, B – näiv- ja reaktiivjuhtivus.

Kasutatakse võõrsõnalisi nimetusi:

R – resistants	X – reaktants,	<u>Z</u> – impedants
G – konduktants	X_L – induktants, X_C – kapatsitants	<u>Y</u> – admitants
	B – sustseptants,	

HULKKLEMM (neliklemm e. kaksport, kolmklemm, kakslemm)