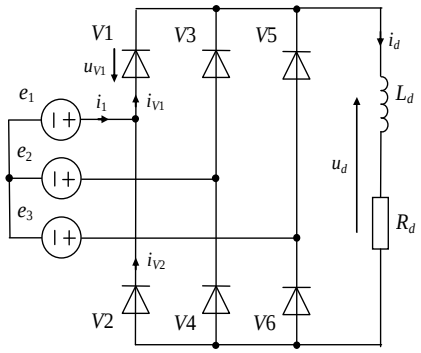
Induktivno opterećen trofazni mosni spoj

$e_1 = 326\sin 100\pi t$, V
$e_2 = 326\sin(100\pi t + 120°)$, V
$e_3 = 326\sin(100\pi t + 240°)$, V
$L_d = 100$ mH
$R_d = 1\,\Omega$



Analiza valnih oblika za zadane vrijednosti

$\omega = 100\pi$ rad/s

$f = \omega/2\pi$ $\qquad \boxed{f = 50\text{ Hz}}$

$T = 1/f$ $\qquad \boxed{T = 20\text{ ms}}$

$\tau = L_d/R_d$ $\qquad \boxed{\tau = 1\text{ s}}$

$\tau >> T/6 \;\Rightarrow\; i_d \approx \text{konst.} = I_d(0) = I_d$

$$U_d(0) = \frac{1}{\frac{2\pi}{3}} \cdot 2\int_{\frac{\pi}{6}}^{\frac{5\pi}{6}} \hat{E}\sin\omega t\, d\omega t$$

$$U_d(0) = \frac{3\sqrt{3}}{\pi}\hat{E} \qquad \boxed{U_d(0) = 539{,}2\text{ V}}$$

$U_d(0) = U_{Ld}(0) + U_{Rd}(0)$ $\qquad U_{Ld}(0) = 0$ $\qquad U_d(0) = U_{Rd}(0)$

$$I_d(0) = \frac{U_d(0)}{R_d} \qquad \boxed{I_d(0) = 539{,}2\text{ A}}$$

$$I_{V1}(0) = I_{V2}(0) = \ldots = I_{V6}(0) = \frac{I_d(0)}{3} \qquad \boxed{I_{V1}(0) = 179{,}7\text{ A}}$$

$$I_{V1} = I_{V2} = \ldots = I_{V6} = I_d(0)\frac{1}{\sqrt{3}} \qquad \boxed{I_{V1} = 311{,}3\text{ A}}$$

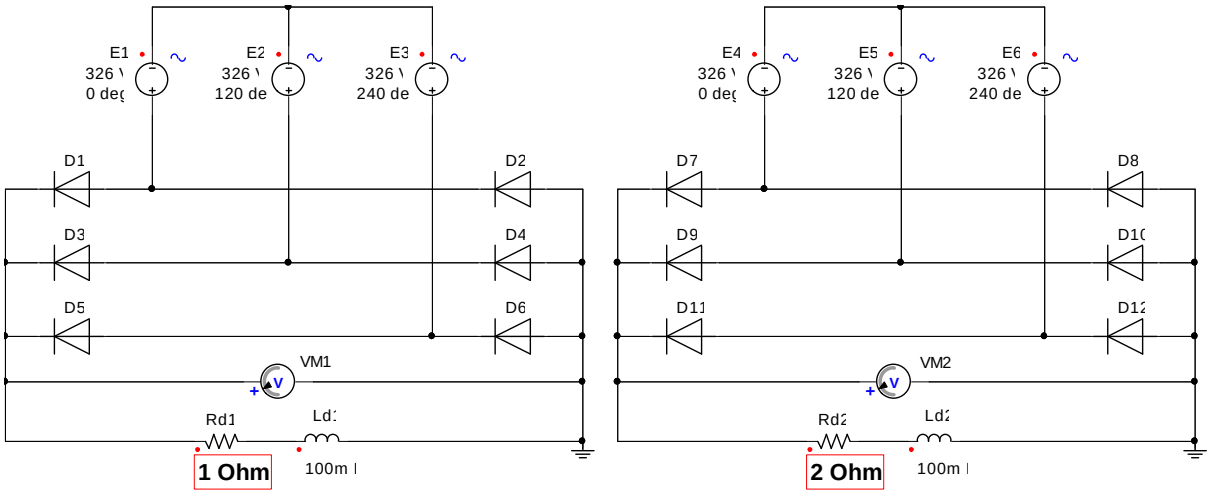
$i_1 = i_{V1} - i_{V2}$

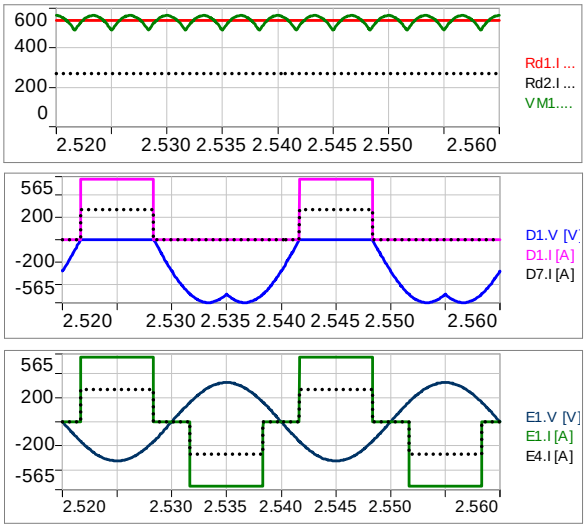
$I_1(0) = I_{V1}(0) - I_{V2}(0)$ $\qquad \boxed{I_1(0) = 0}$

$$I_1 = I_2 = I_3 = I_d\sqrt{\frac{2}{3}} \qquad \boxed{I_1 = 440{,}3\text{ A}}$$

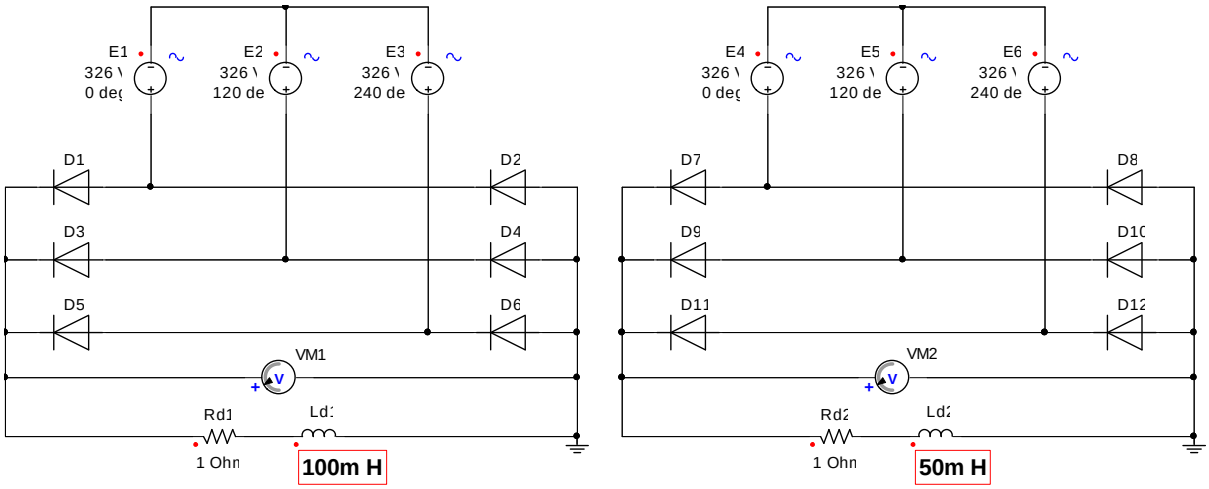
U nastavku su prikazani simulacijom dobiveni valni oblici pri promjeni parametara R_d i L_d.

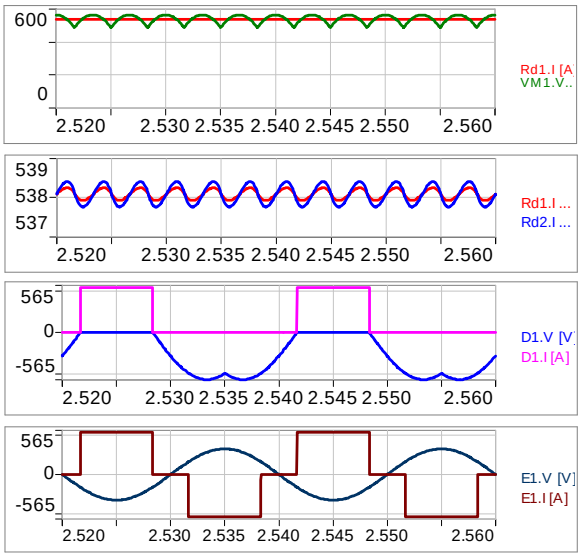
Ovisnost valnih oblika induktivno opterećenog trofaznog mosnog spoja o otporu trošila R_d





Ovisnost valnih oblika induktivno opterećenog trofaznog mosnog spoja o induktivitetu L_d





Induktivitet trošila ne utječe na srednju vrijednost struje trošila, nego samo na njenu valovitost.