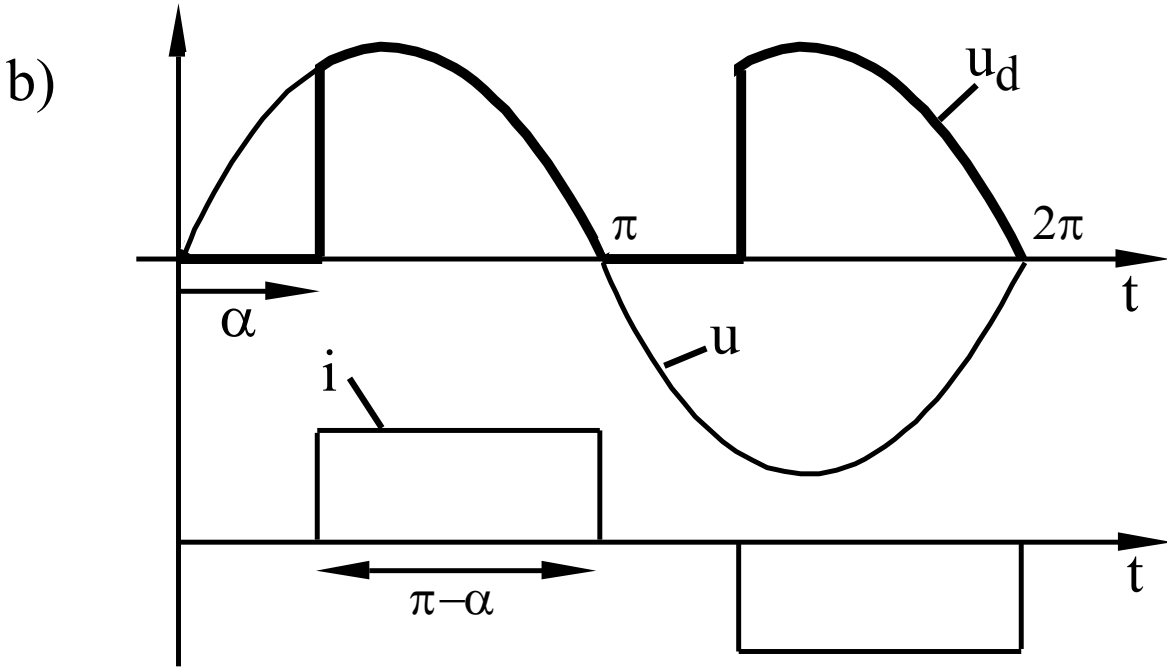
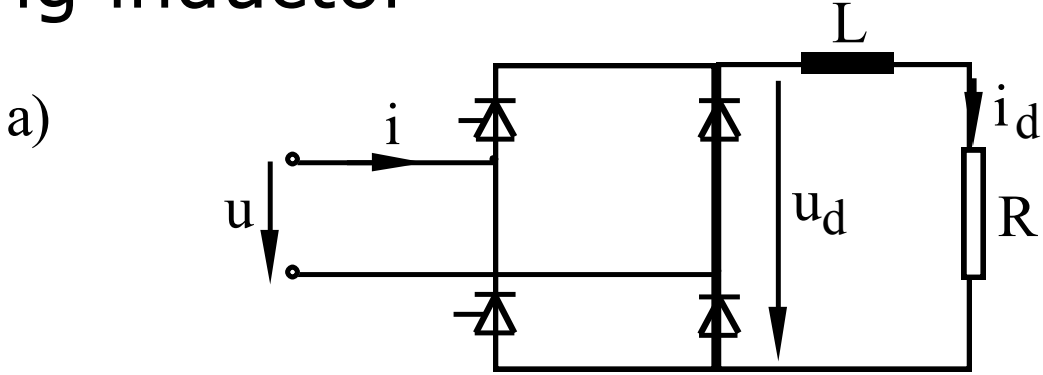


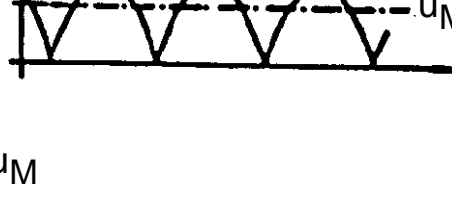
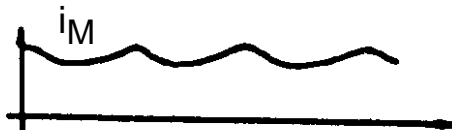
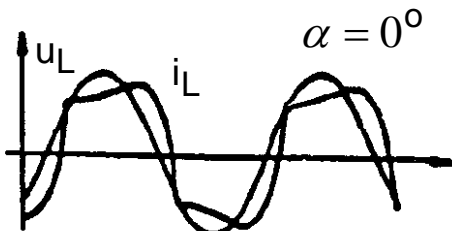
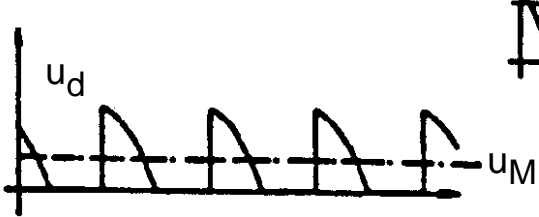
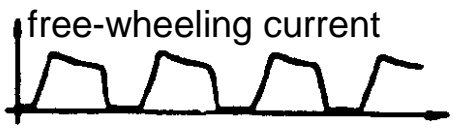
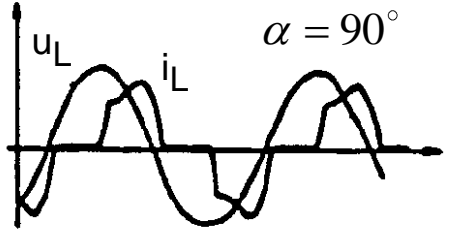
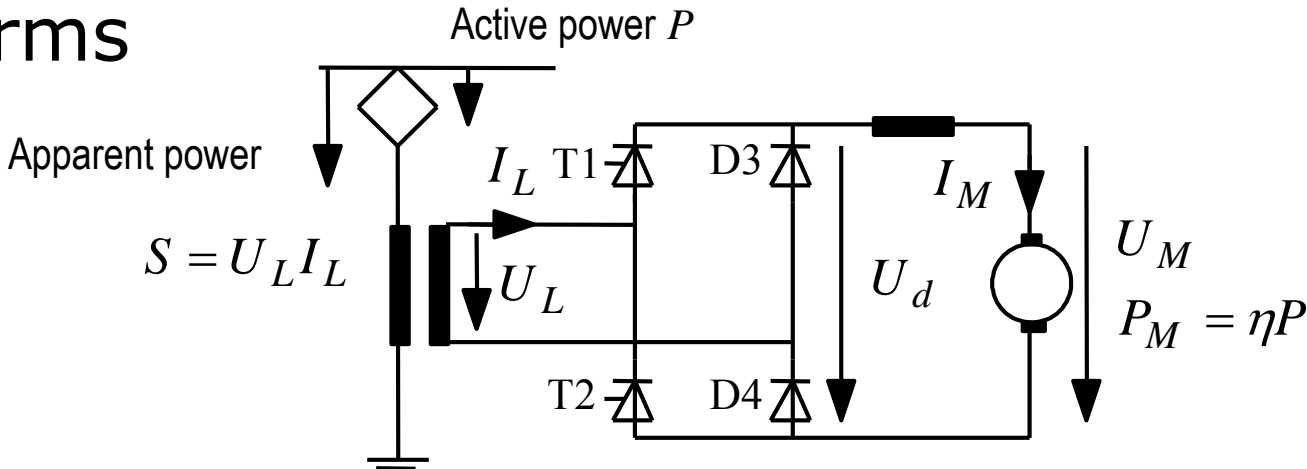
Half-controlled thyristor rectifier with smoothing inductor



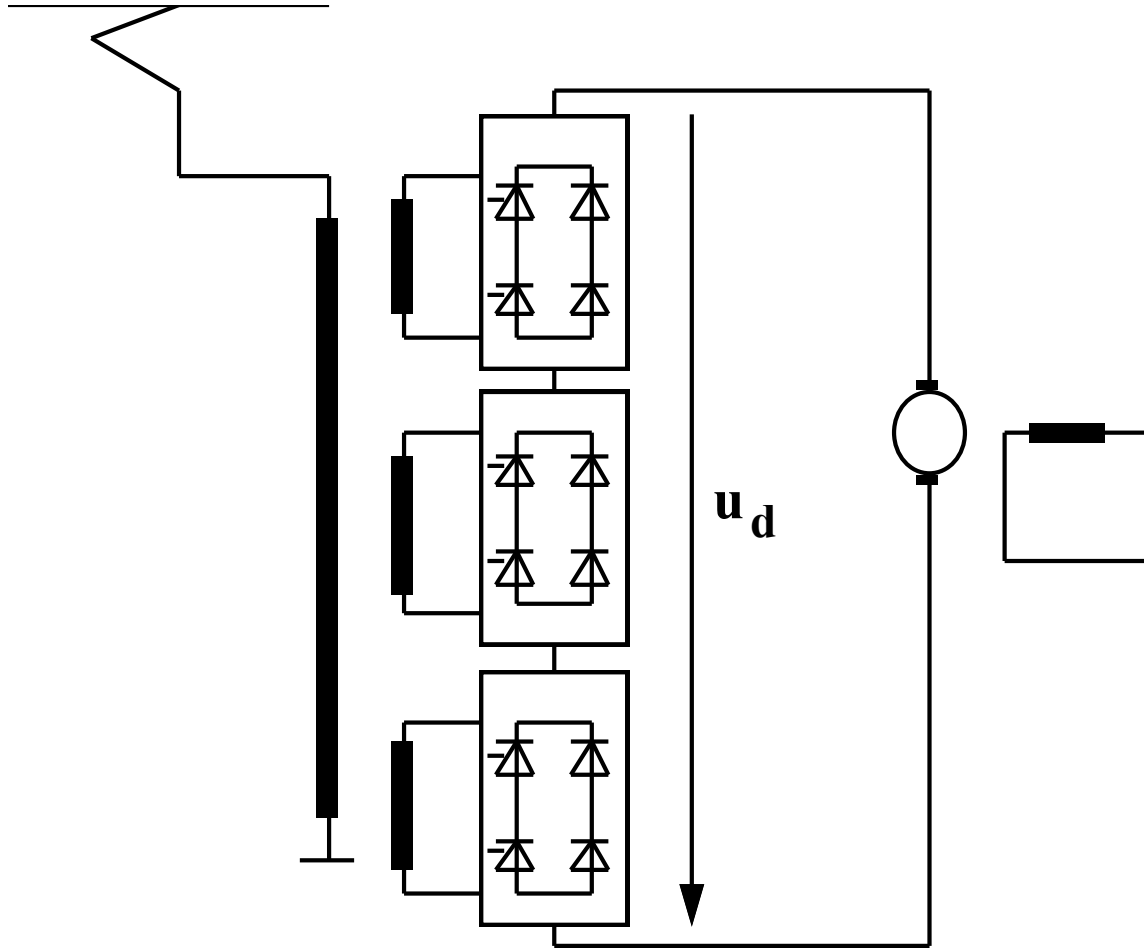
Definition of power factor

$$\lambda = \frac{P}{S} = \frac{P}{U_{rms} I_{rms}} \approx \frac{I_{(1)}}{I_{rms}} \cos \phi = \frac{I_{(1)}}{I_{rms}} \cos \alpha$$

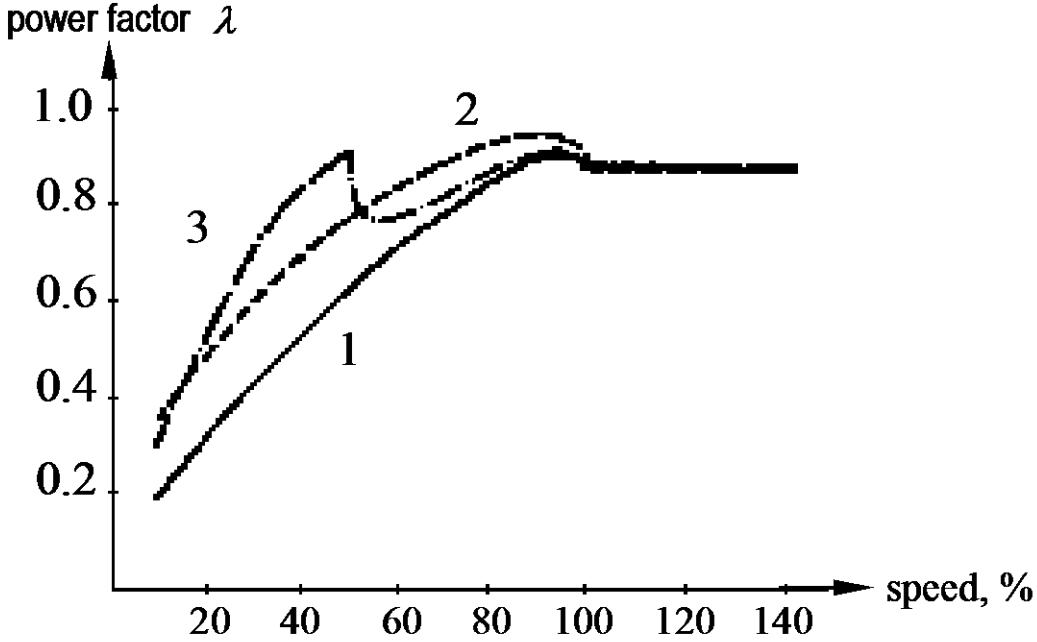
Half controlled rectifier bridge with examples of curve forms



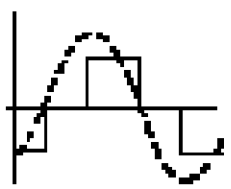
Three-level rectifiers for Rc1



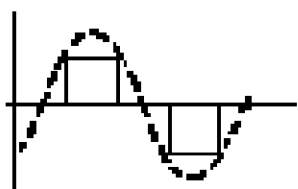
Power factor for some common connections



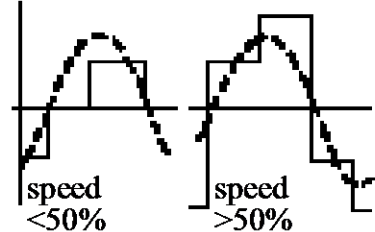
1. half-contr. thy. bridge



2. turn-off capability (LUB)

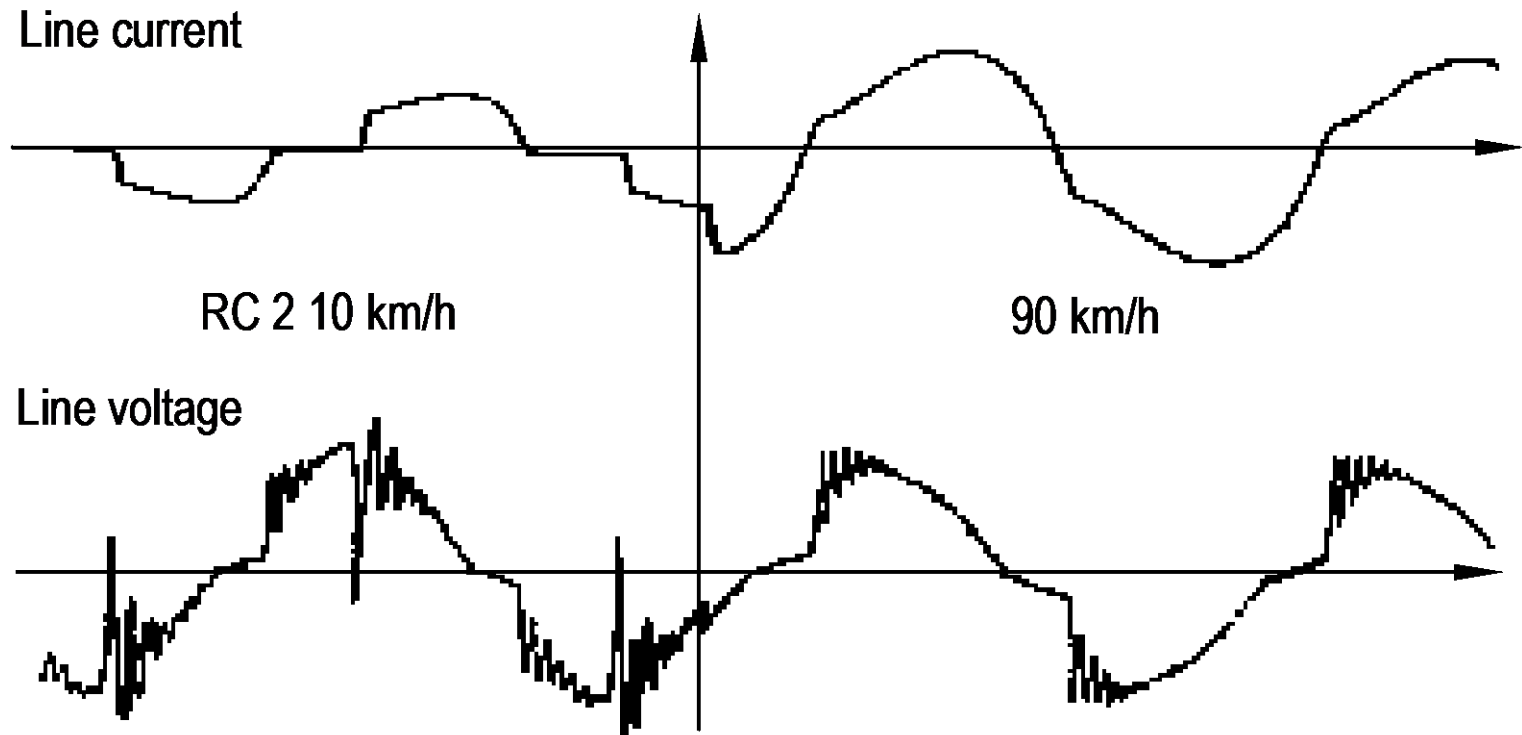


3. series connected half-contr. bridges

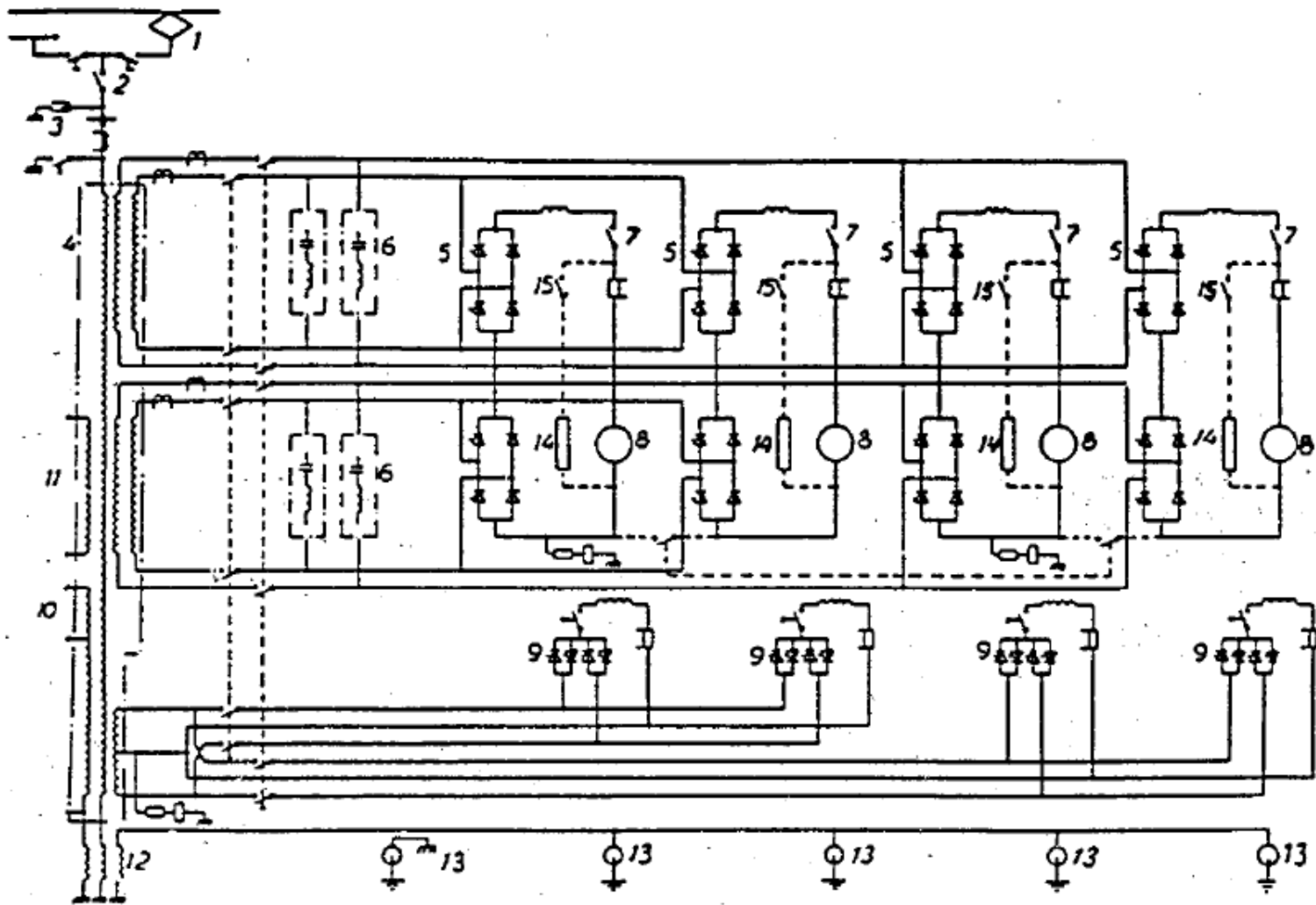


— current
 voltage

Measured voltage and current for two series connected phase-controlled bridges

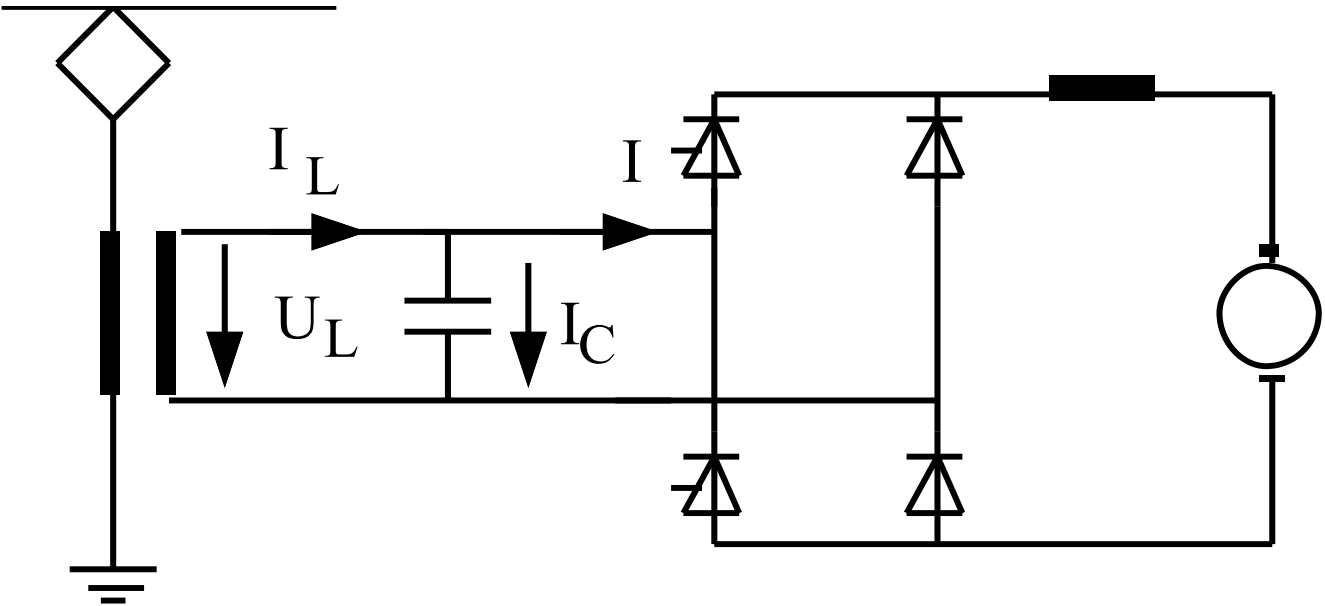


Circuit diagram Rc2-6

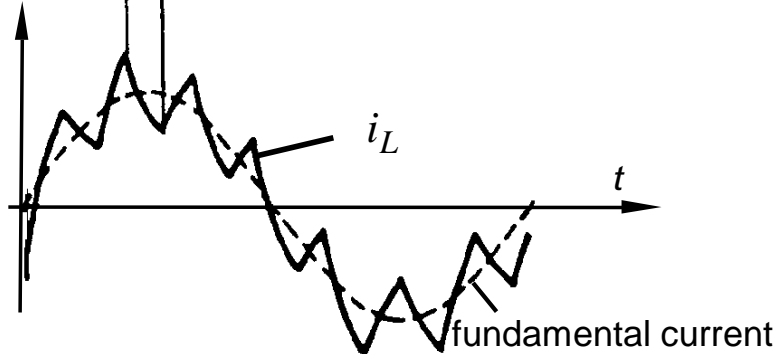
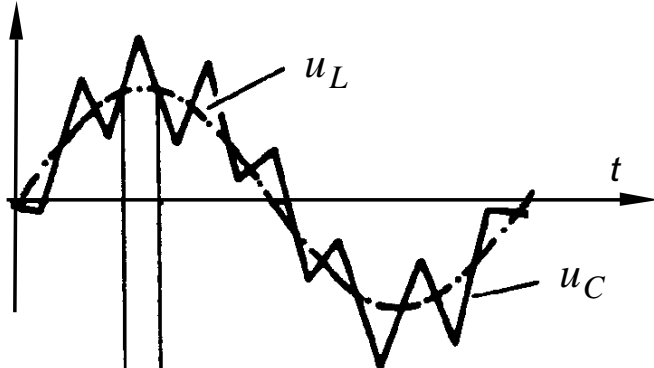
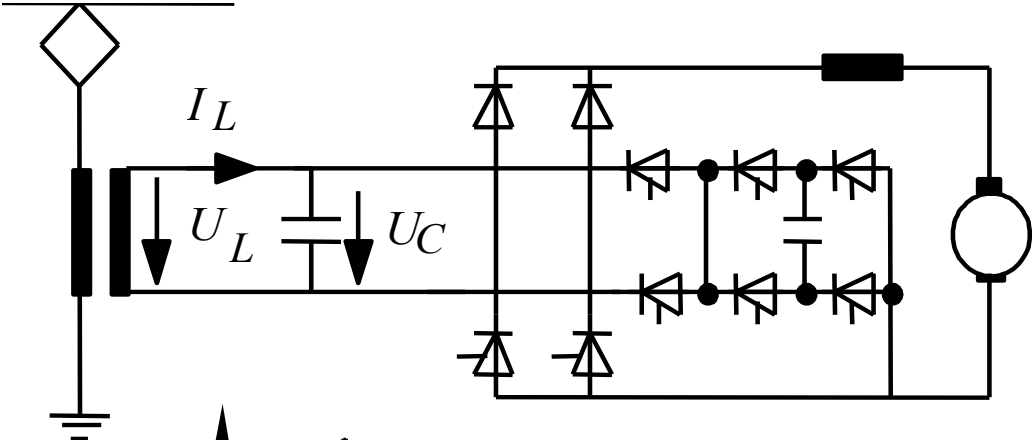


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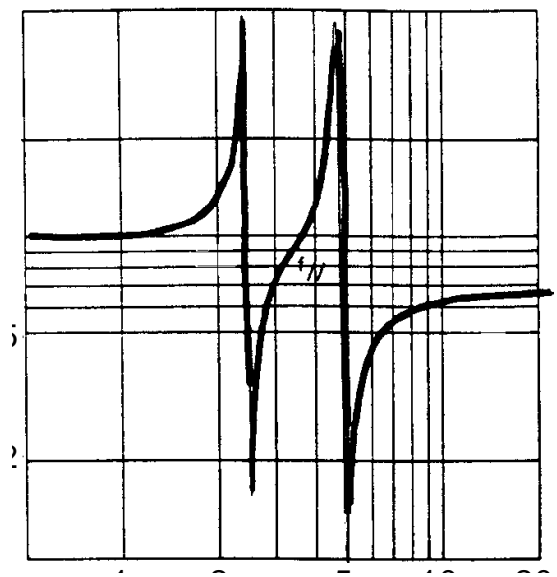
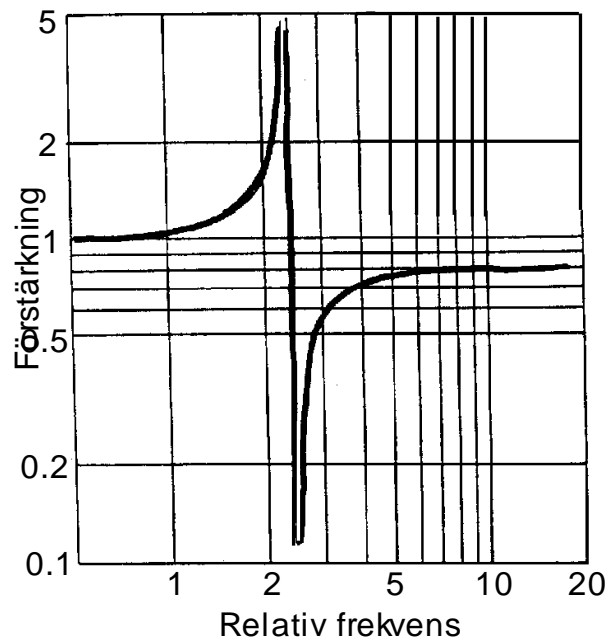
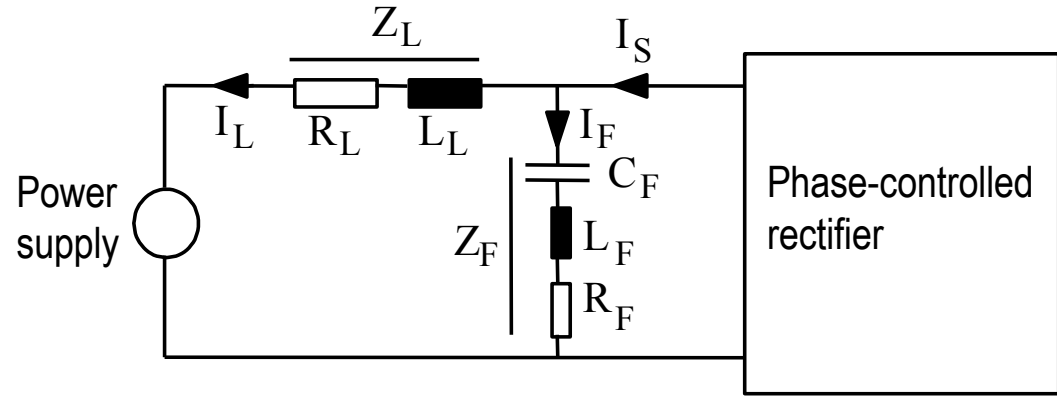
Capacitive phase compensation



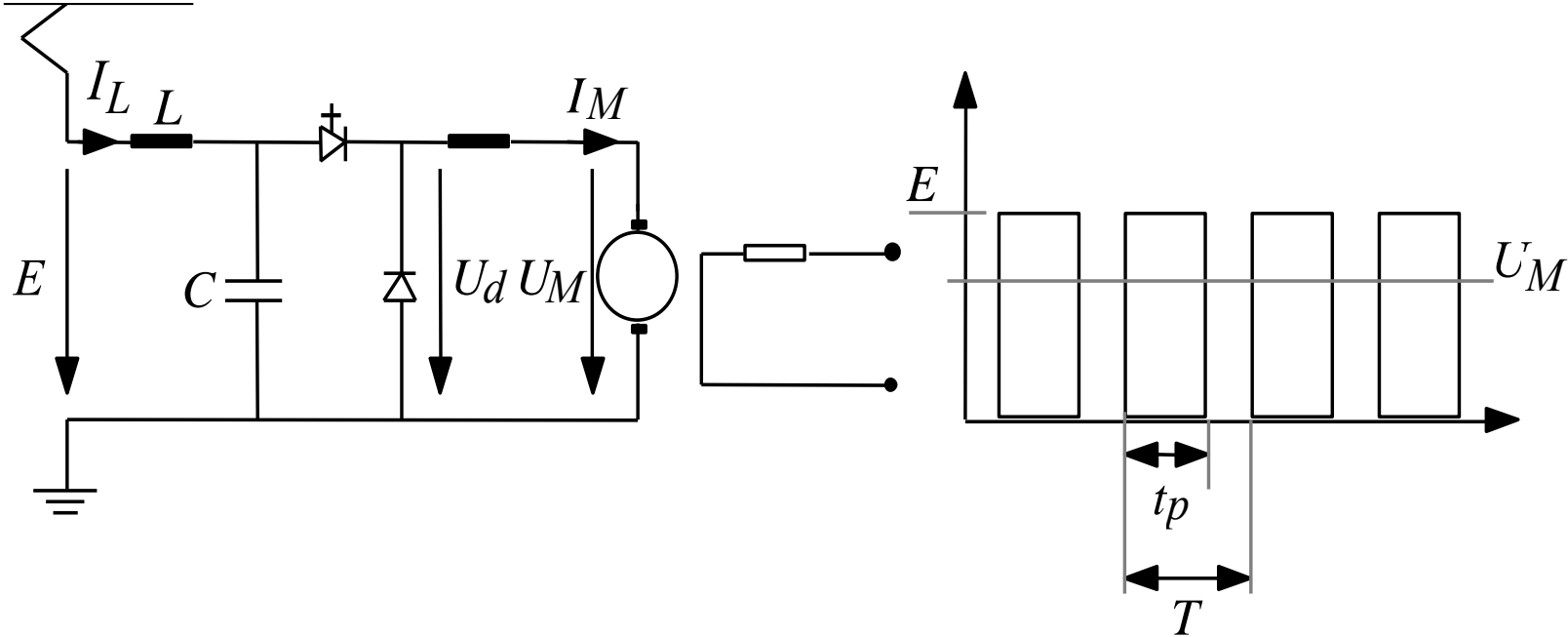
Pulsed Current Source Converter



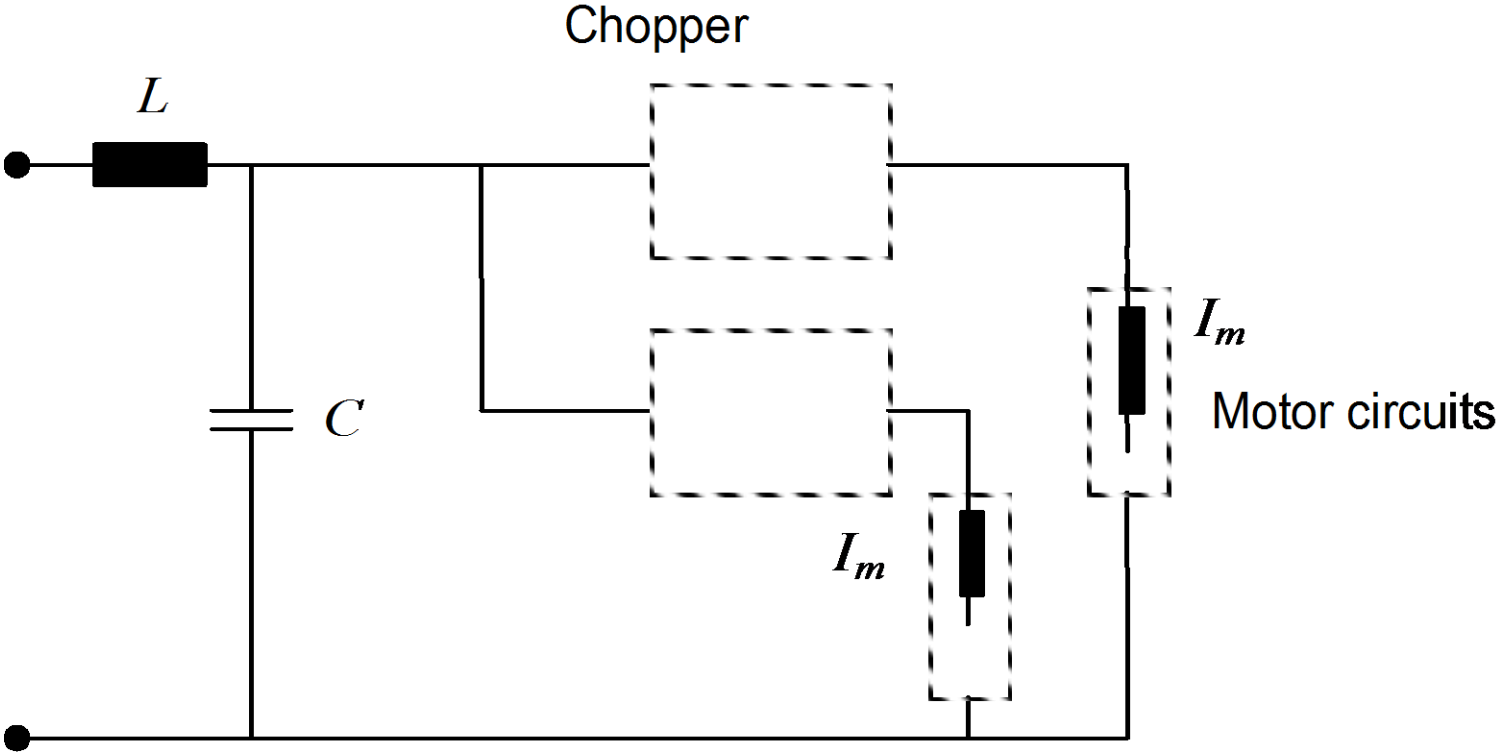
Characteristics for a) single tuned filter, b) two tuned links



Schematic circuit solution for a step-down chopper in a rail vehicle

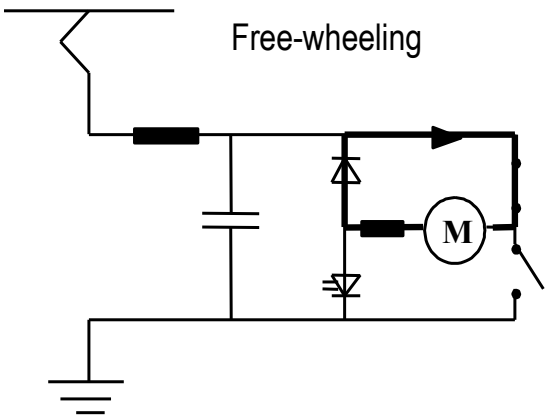
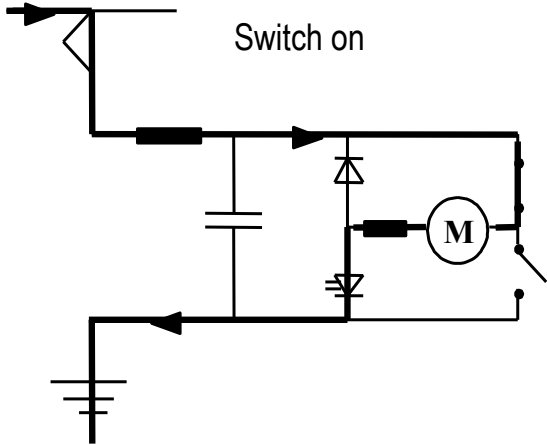


Equivalent circuit for a system with two parallel choppers

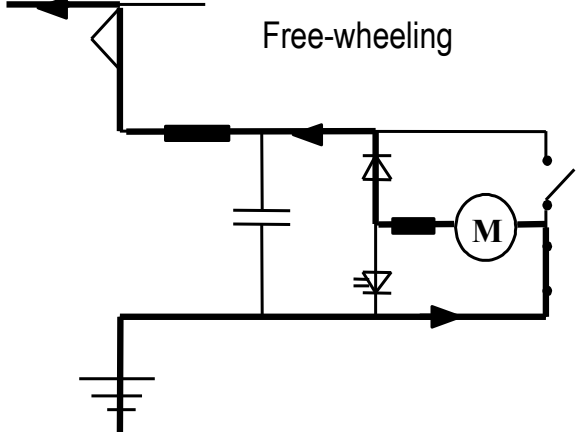
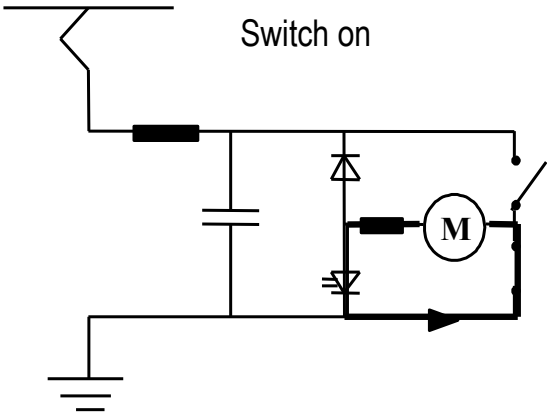


Conduction and free-wheeling intervals for a chopper in motor and generator operation

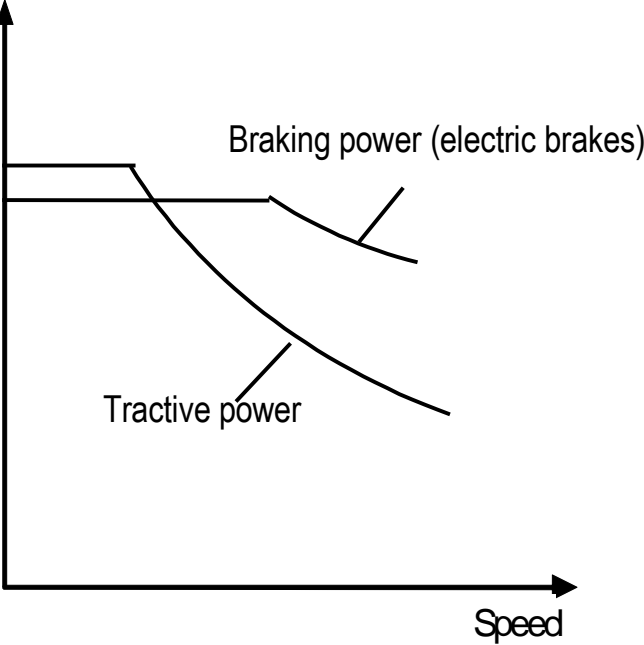
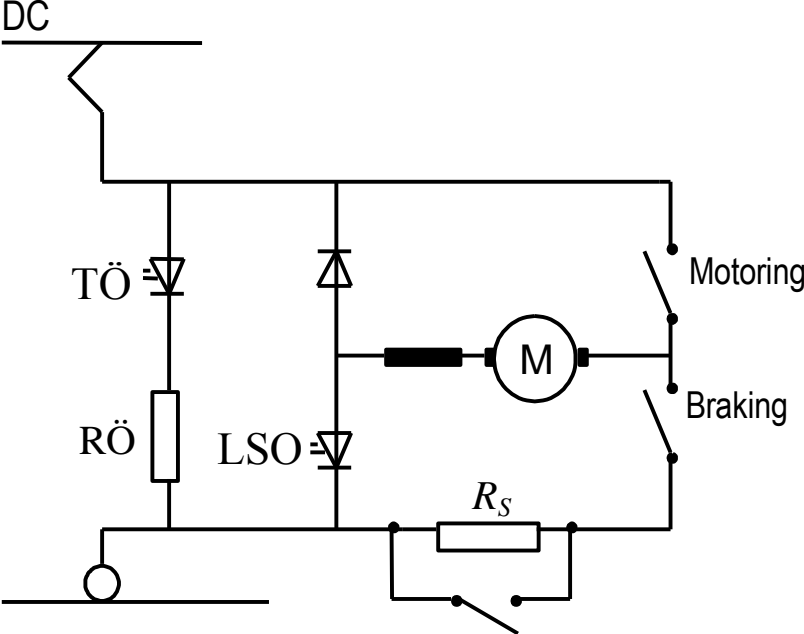
Motor operation



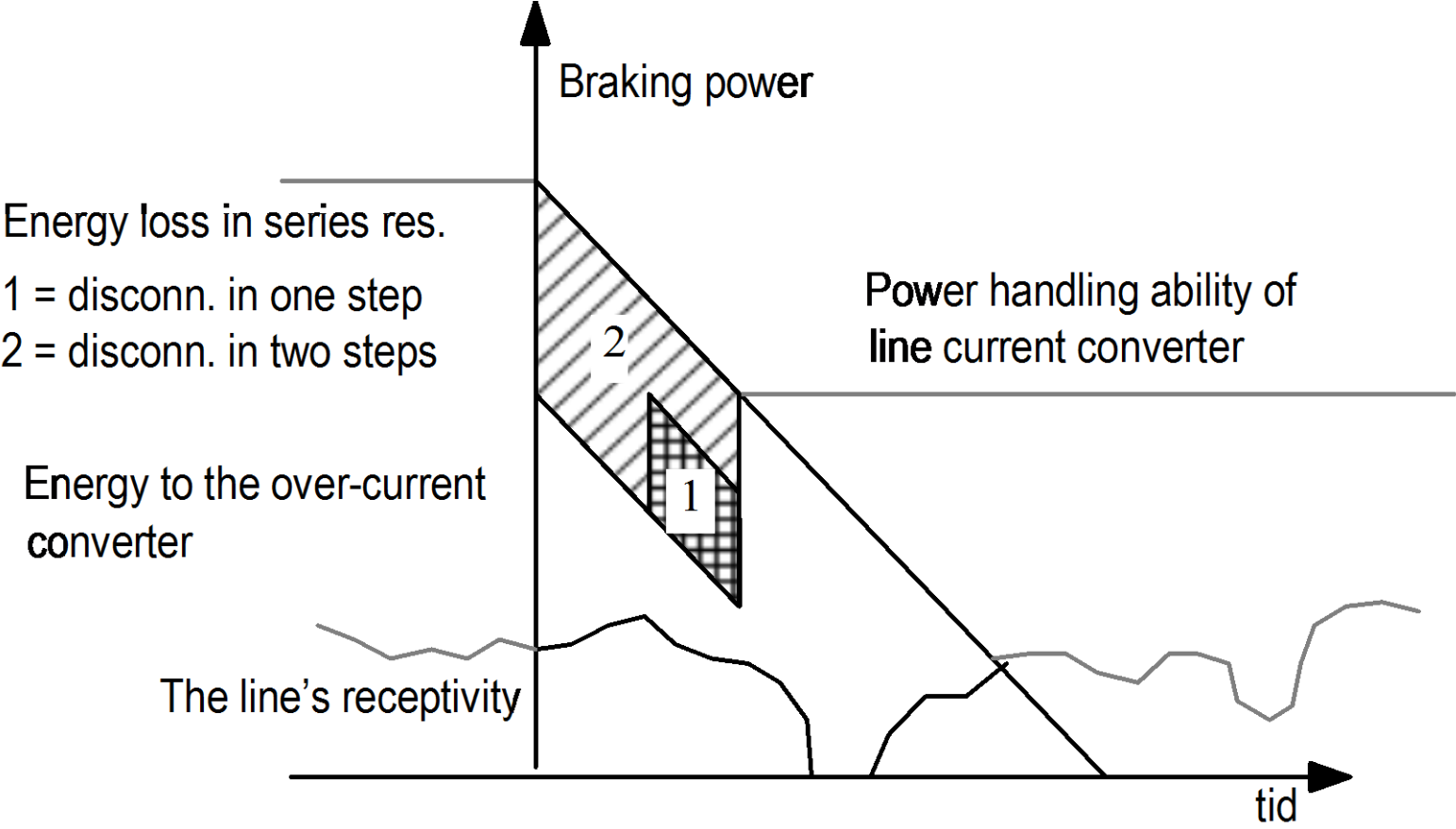
Generator operation



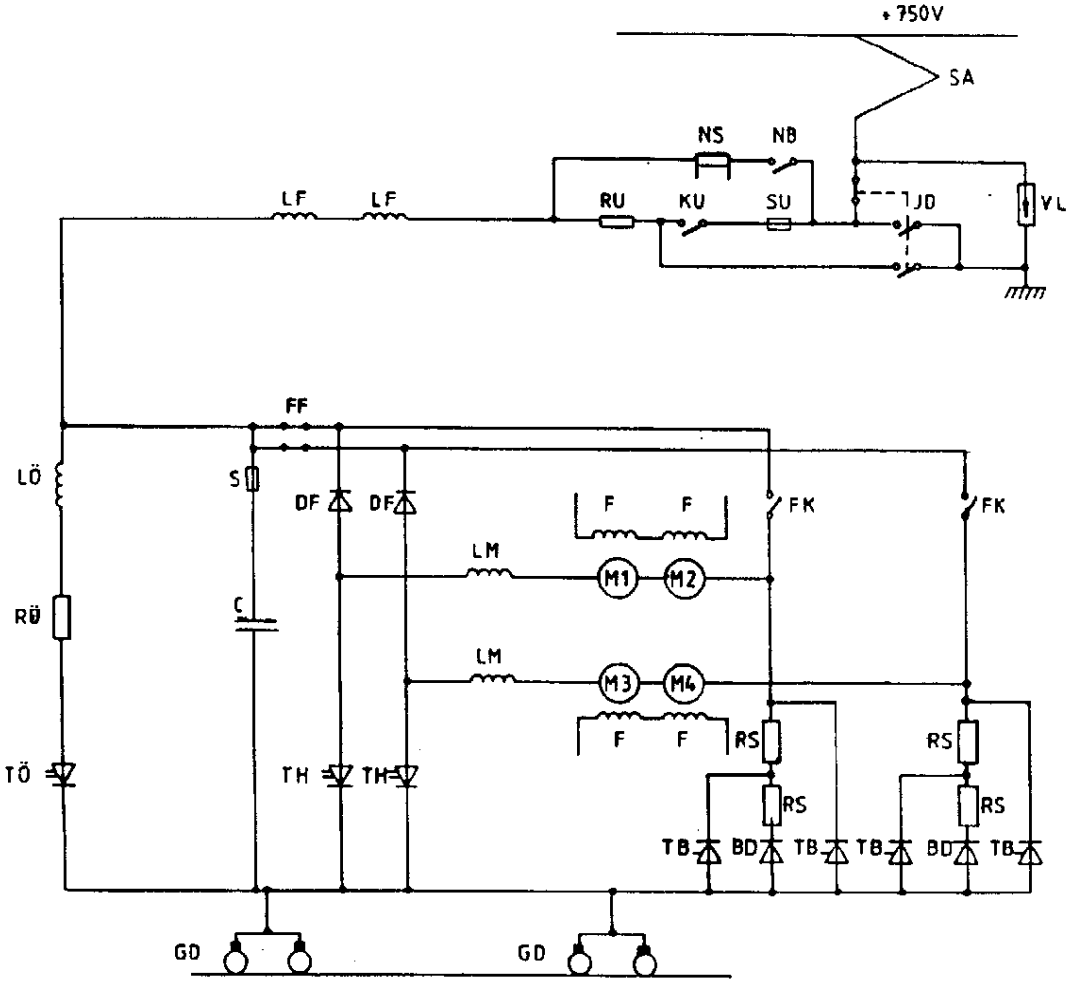
Braking system with over-voltage converter and separate series resistor



Energy distribution during braking



Main circuit for a tram equipped with choppers (Gothenburg, class M21)



- SA Strömavtagare
- NB Linjebrytare
- NS Överströmsskydd
- LF Linjeinduktor
- JKD Jordningsdon
- VL Ventilavledare
- SU Säkring- kond. uppladdning
- KU Kontaktor- "
- RU Motstånd- "
- FK Fartkontaktor
- M-F Traktionsmotorer
- TÖ Översp. omriktare
- LÖ " - induktor
- RÖ " - motstånd
- S Säkring
- C Nätkondensator
- DF Frihjulsdiod
- TH Släckbar huvudtyristor
- LM Fasinduktor
- TB Bromstyristor
- BD Bromsdiod
- FF Fas fränskiljare
- GD Återledningsdon
- RS Seriemotstånd