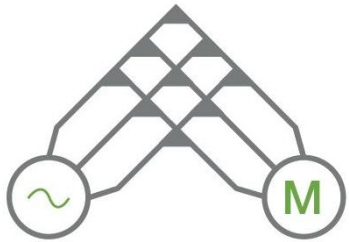


De Yaskawa U1000

Matrix Converter

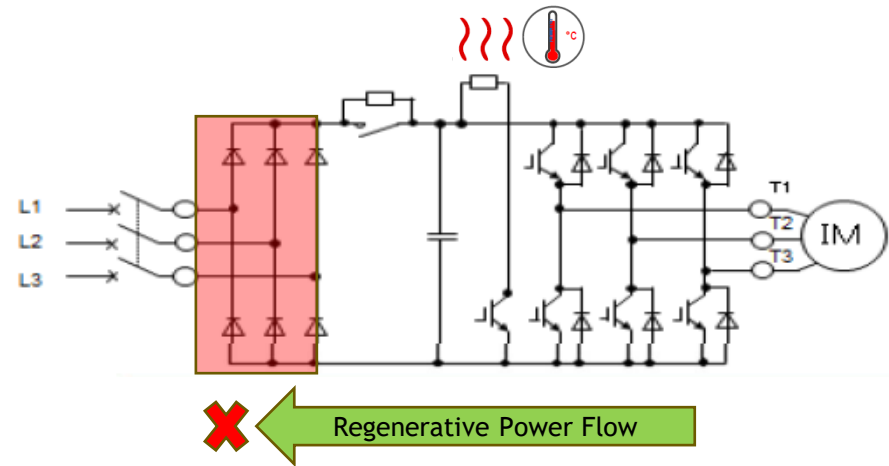
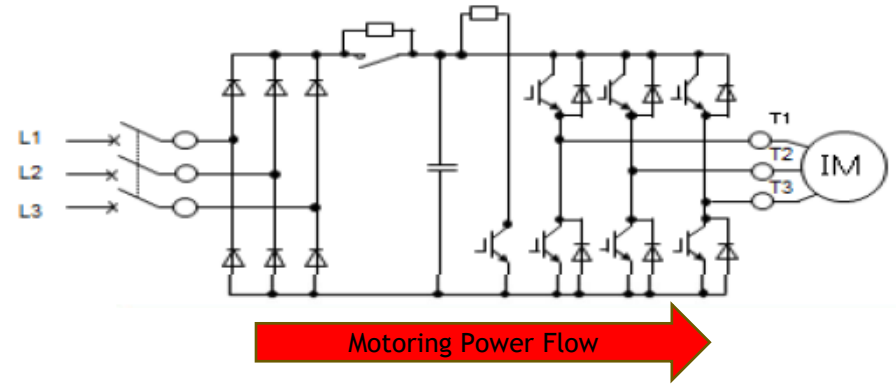
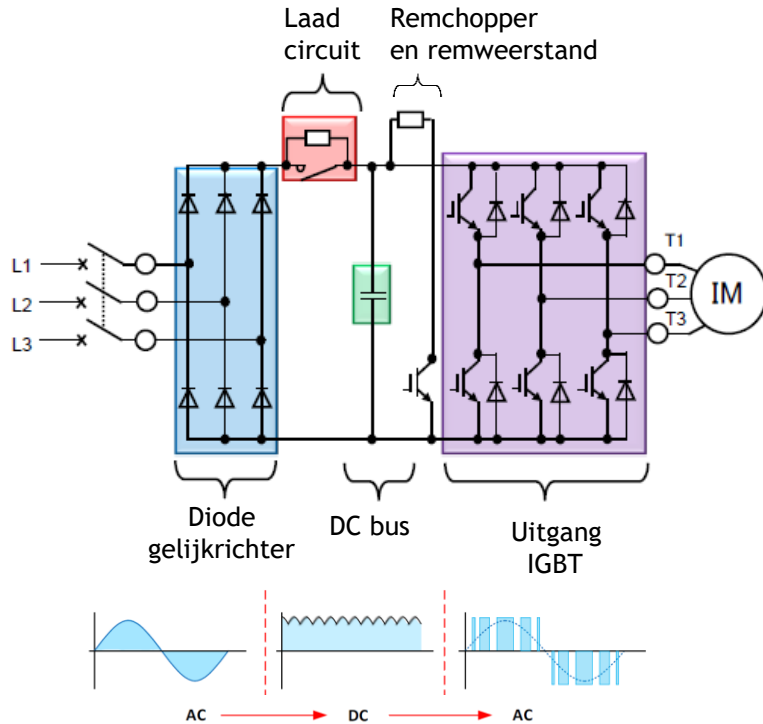


Presentatie door Gideon Spaen



Paul Huppertz, MCA >

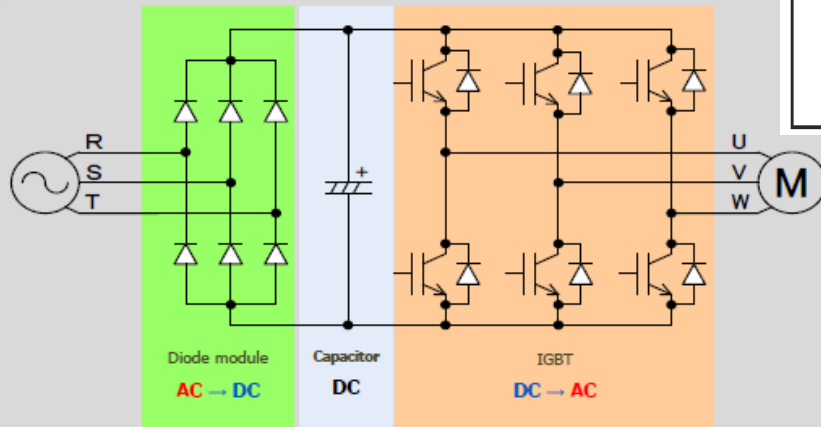
Conventionele frequentieregelaar



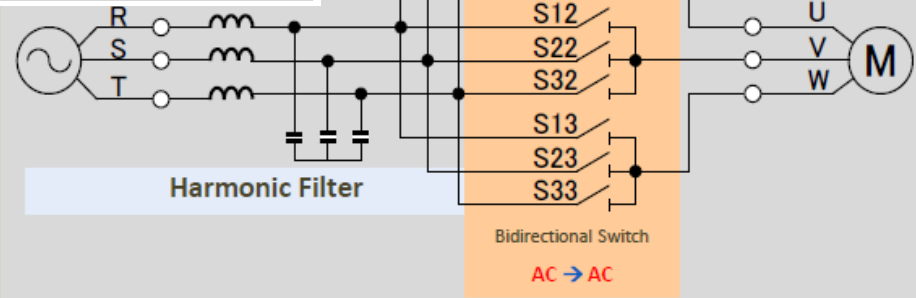
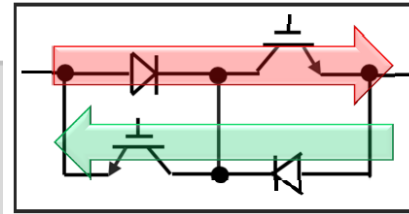
Matrix converter: wat is dat?

- Een matrix converter is een directe inverter zonder DC bus.
- Hij heeft 9 bidirectionele schakelaars ingebouwd en kan elke ingangsfase direct met elke uitgangsfase verbinden.

- Door deze schakelaars zeer snel op elkaar af te stemmen, kan een matrix converter de vaste netspanning en netfrequentie omzetten in een variabele spanning en frequentie



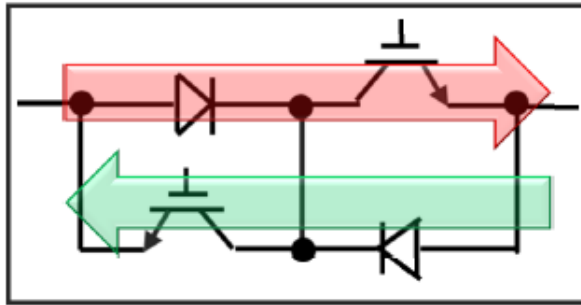
Traditional Inverter Topology



Matrix Converter Topology

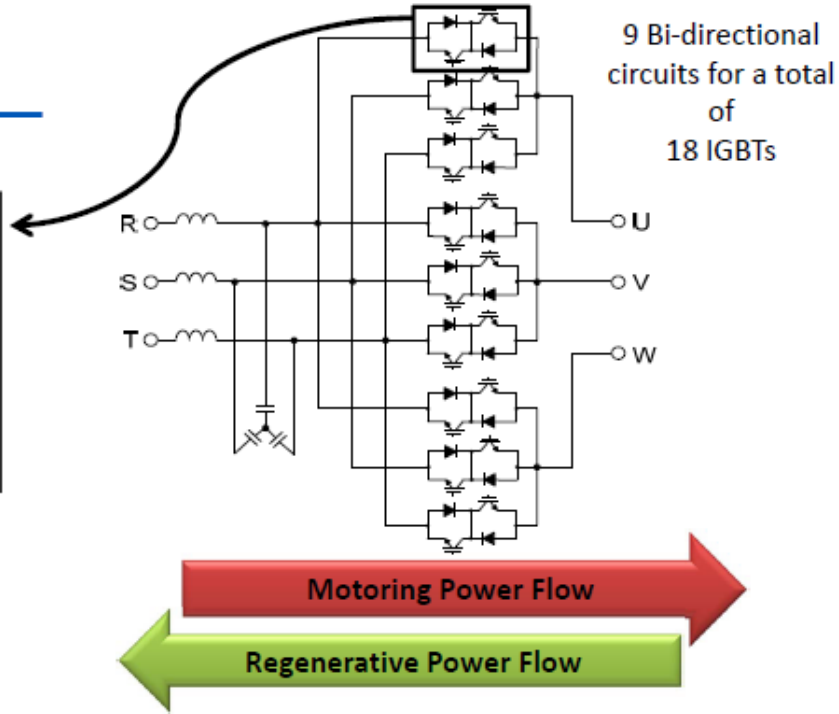
Matrix converter: wat is dat?

Bi-Directional Power Flow

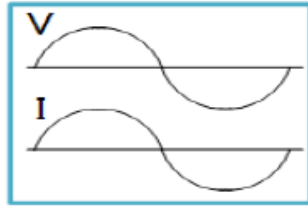


IGBT+FWD

Instantaneous
Motoring & Regeneration

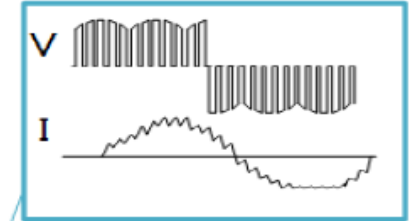
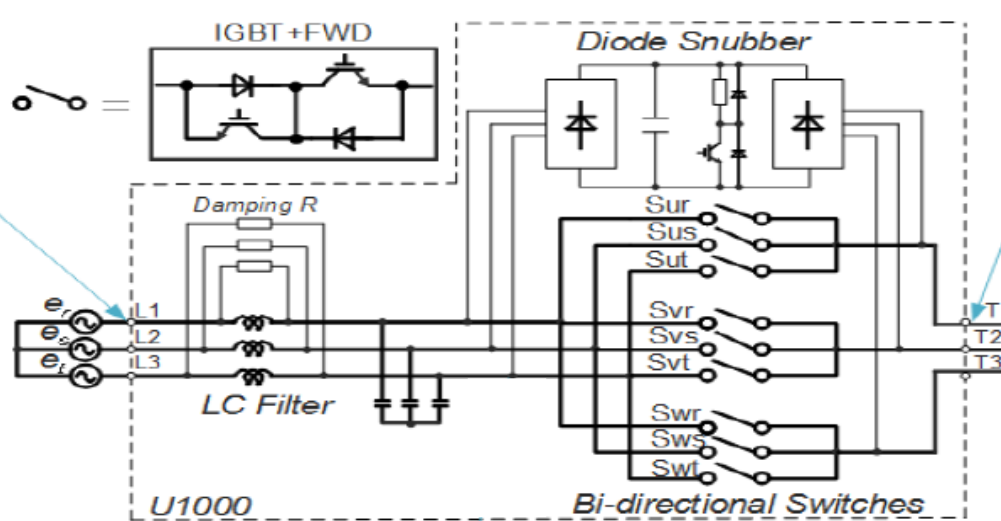


Matrix converter: wat is dat?



Input voltage & current are **Sinusoidal Waveforms**.

Compact built-in PWM filter eliminates high frequency components.



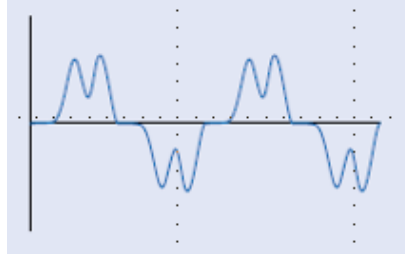
Matrix Drive output similar to a conventional drive.

- Input voltage waveform matched output.
- Waveform is synced to the frequency of the line voltage.

Vergelijk harmonische vervorming ingangsstroom



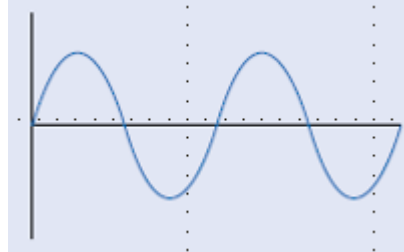
Standard
AC drive



88%
Current distortion

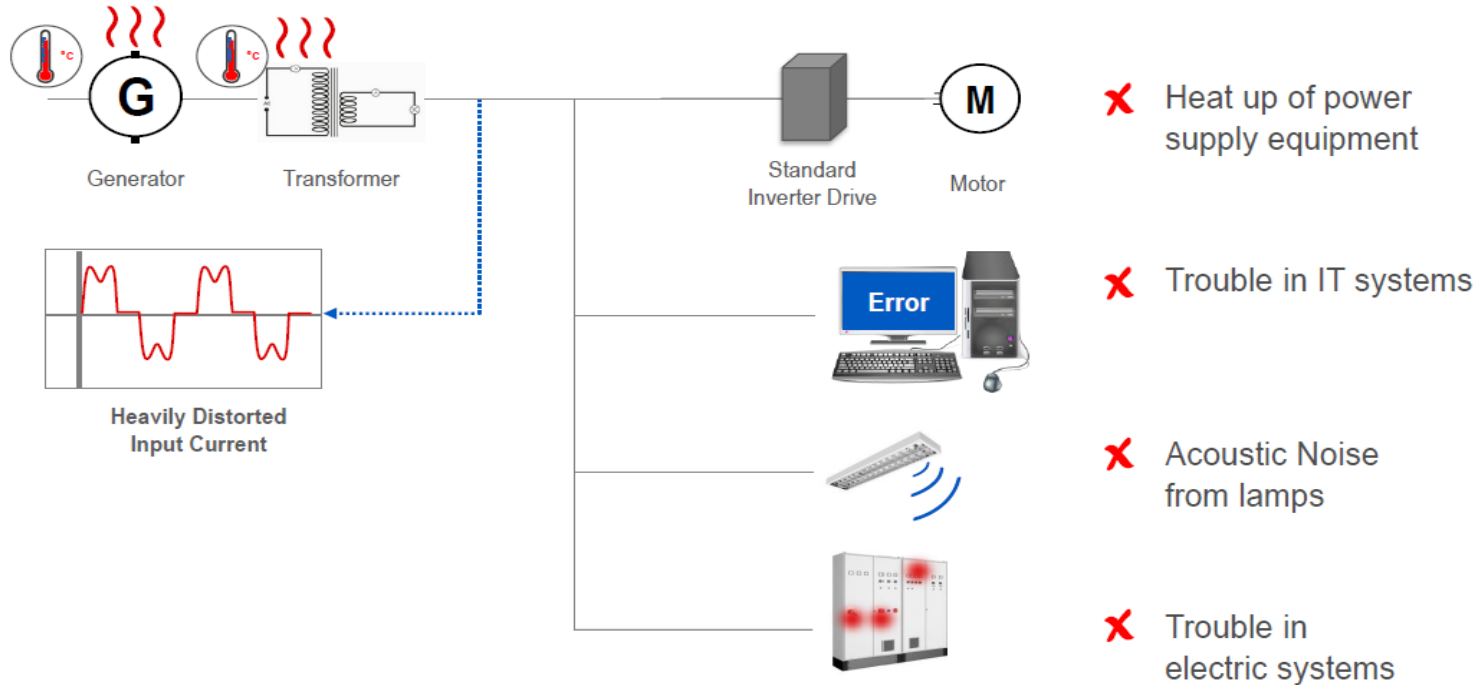


Matrix
converter
U1000

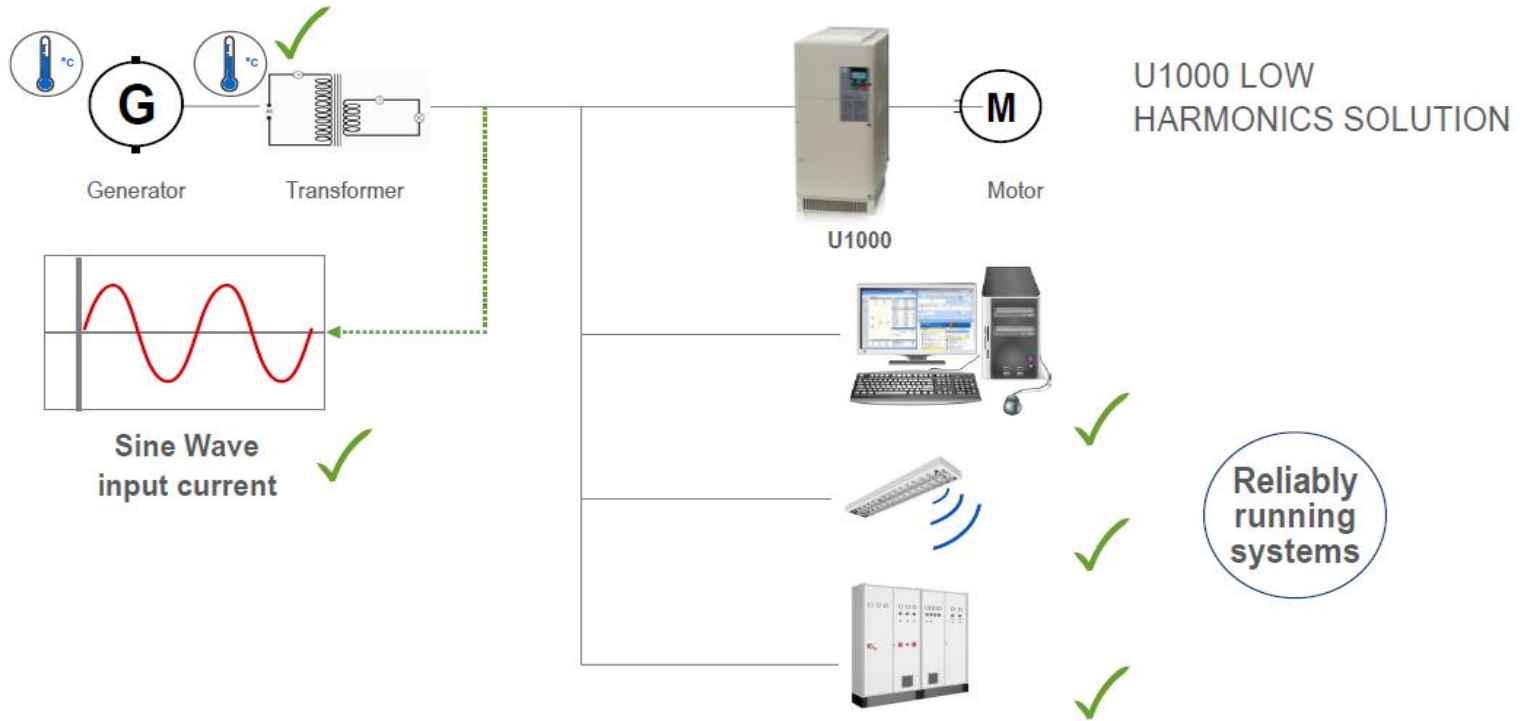


3 - 5%
Current distortion

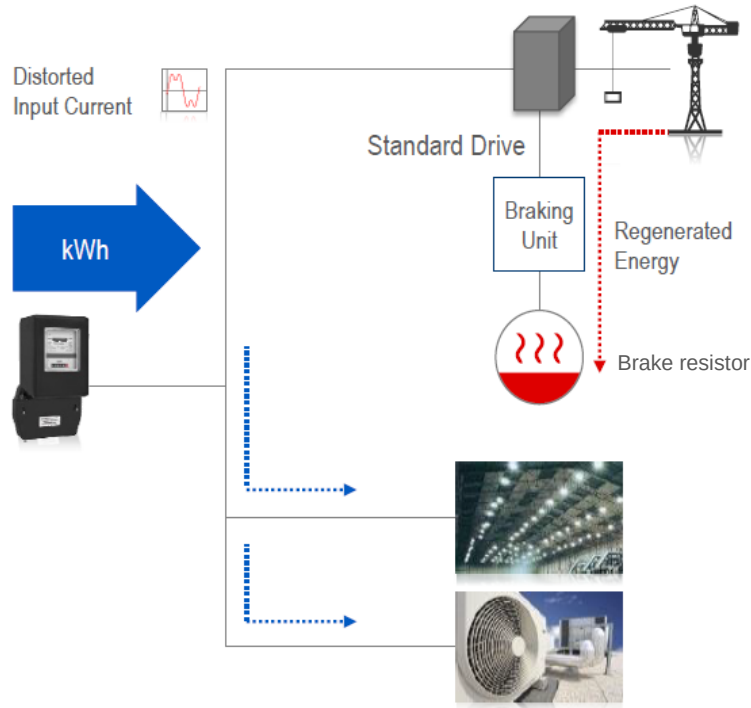
Effect harmonisch vervuilde ingangsstroom



Effect bijna geen harmonische ingangsstroom

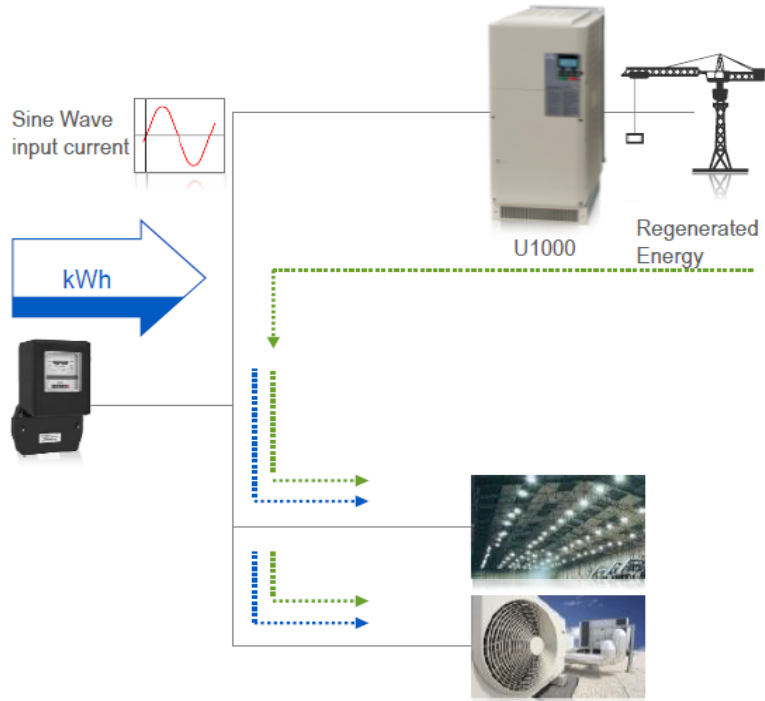


Generatieve energie omzetten in warmte via remweerstand



- ✗ Waste of regenerative energy in braking resistors
- ✗ Heat generation and hazard of fire
- ✗ Many parts required

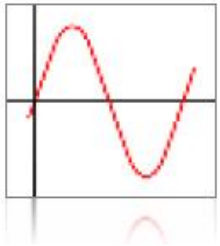
Generatieve energie hergebruiken



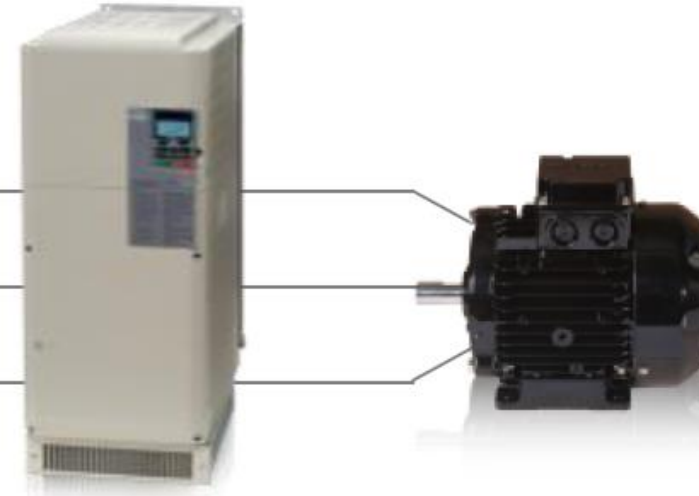
- Regenerated braking energy is used by illumination, ventilation or other consumers
- Lower energy consumption
- Less CO₂ emission
- Reduced energy cost

Eenvoudig aansluiten

LOW
HARMONICS



POWER
REGENERATION



U1000 MATRIX
CONVERTER

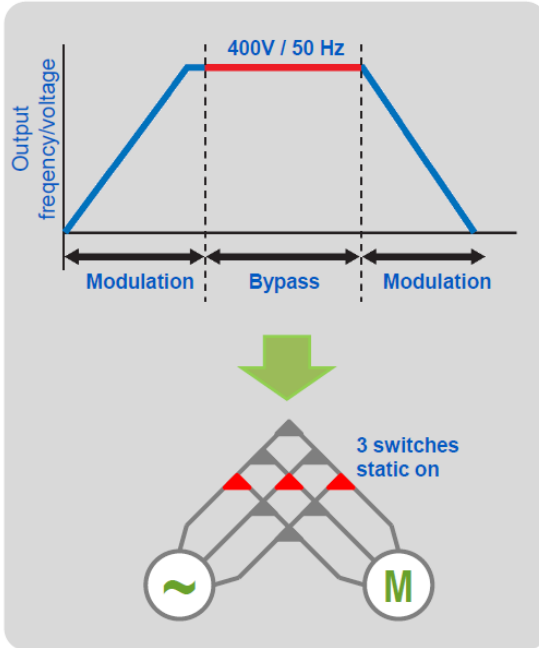
LESS SPACE

FASTER SETUP

HIGHER EFFICIENCY

Interne bypass

Direct connection of motor and grid at full voltage / grid frequency



- No switching loss
- No harmonics
- Higher Efficiency (~0.5% on 11 kW U1000)
- Smooth switch over without current peak or voltage spikes
- Silent motor operation
- No peripherals required





Vragen?



MCA linear motion robotics
Elsloo, Twello & Varsseveld
info@mcabv.nl > www.mcabv.nl

Gideon Spaen

