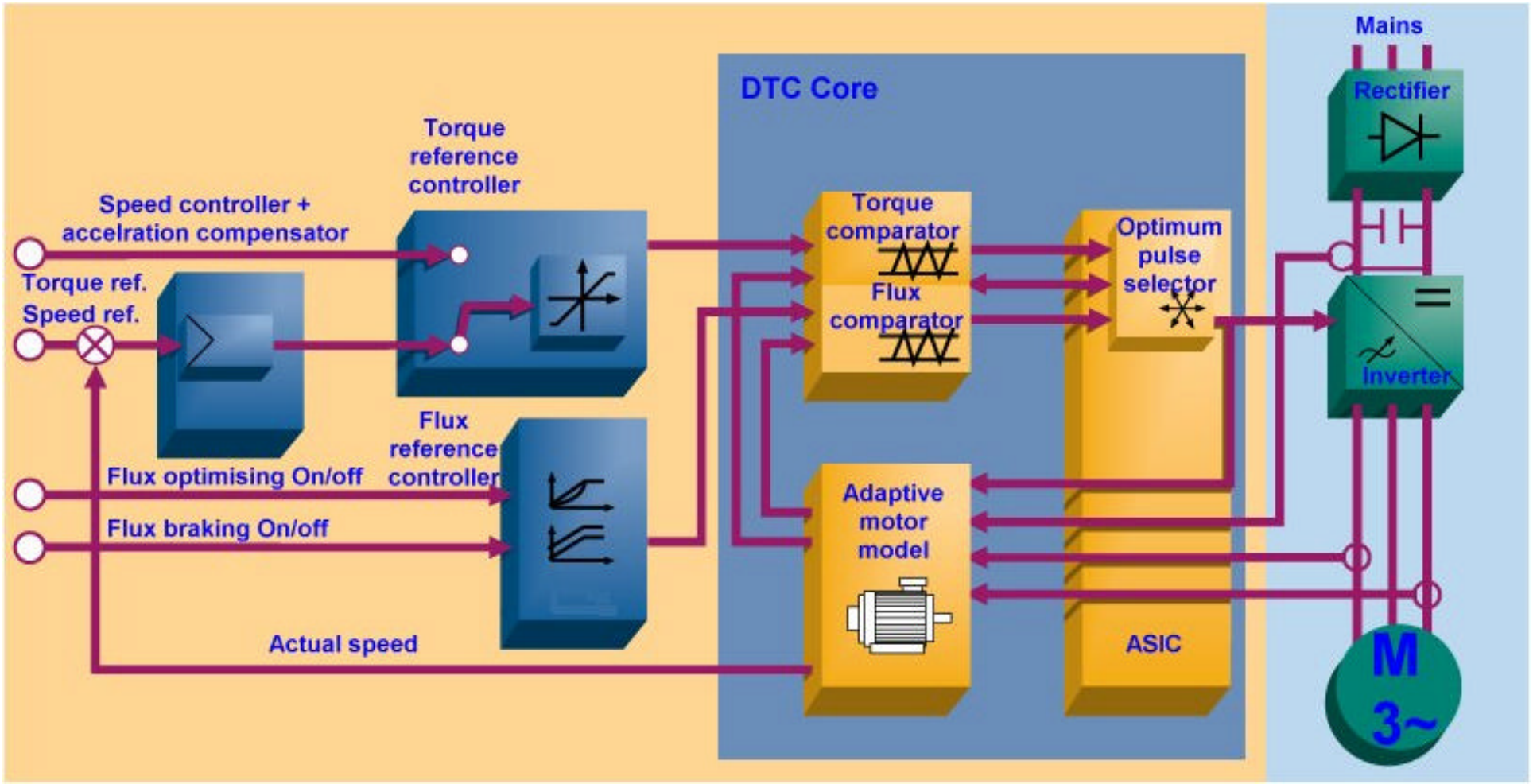
Direct Torque Control principle



Direct Torque Control (DTC) is an optimised AC drives control principle where inverter switching directly controls the motor variables: flux and torque.
The measured input values to the DTC control are ***motor current and voltage***. The voltage is defined from the DC-bus voltage and inverter switch positions.
The voltage and current signals are inputs to an accurate ***motor model*** which produces an exact actual value of stator flux and torque every 25 microseconds.
Motor torque and flux ***two-level comparators*** compare the actual values to the reference values produced by ***torque and flux reference controllers***.
The outputs from these two-level controllers are updated every 25 microseconds and they indicate whether the torque or flux has to be varied.
Depending on the outputs from the two-level controllers, the ***switching logic*** directly determines the optimum inverter switch positions. Therefore every single voltage pulse is determined separately at "atomic level".The inverter switch positions again determine the motor voltage and current, which in turn influence the motor torque and flux and the control loop is closed.