

IGBT DC Chopper

Description

Vossloh Kiepe offers IGBT DC chopper solutions for the modernization of existing DC traction current circuits. Different control versions are possible due to the system's modular construction. Different models can either be integrated into new vehicles or be adapted to existing systems.

The IGBT DC chopper basic model is mainly used for the control and supply of four cross-connected DC series-wound traction motors.

This chopper model, however, is especially suited for replacing cam shaft control assemblies. Here, the field weakening is carried out via a single or multi-stage contactor control, similar to a switching mechanism controller.

Another IGBT DC chopper model can control and supply either one DC series-wound traction motor or two 110 V series-wound traction motors serially connected.

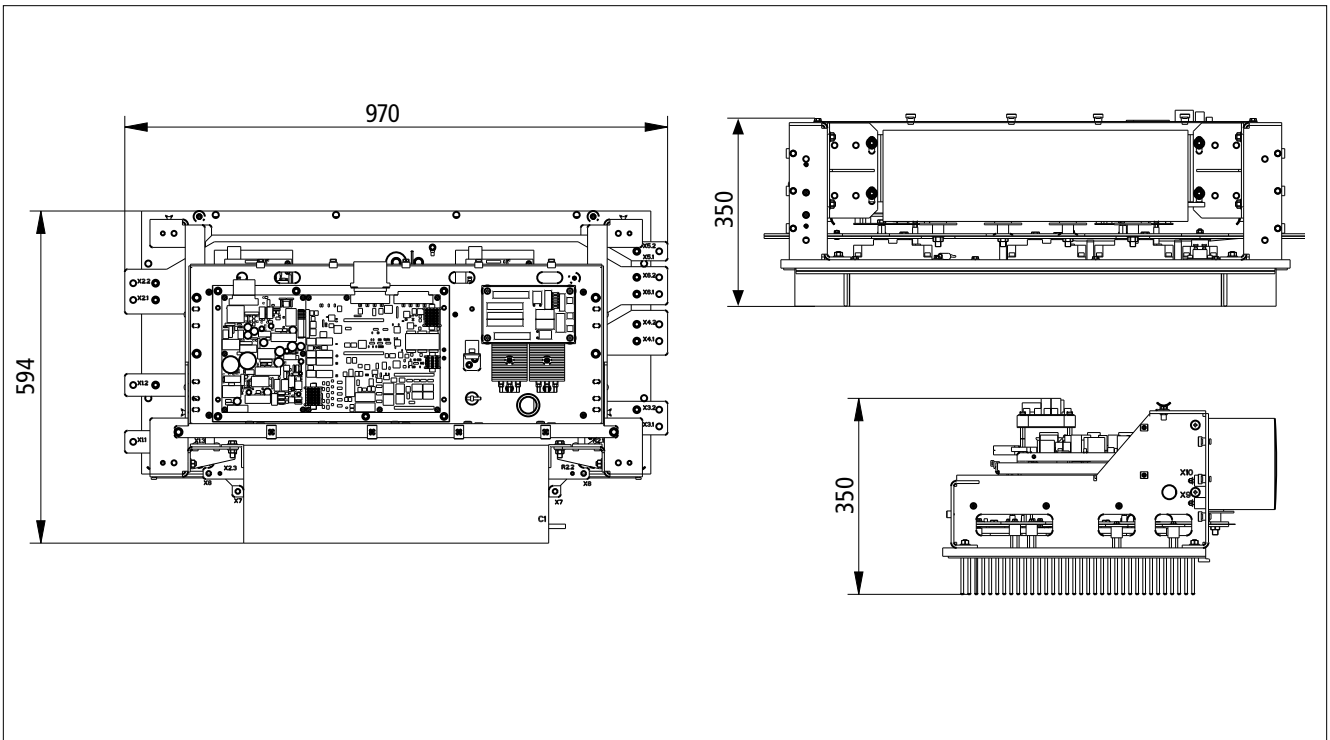
With this chopper model the field weakening is carried out via IGBTs so that the degree of field weakening can be continuously controlled. During the development of this concept one focus was to use as few power contactors as possible. This resulted in a significant reduction of weight.

Due to their modular design the Kiepe choppers are suitable to be integrated into new traction systems as well as those already existing. Apart from the power semiconductor and the filter capacitor, the IGBT chopper modules also contain the corresponding control electronics and measurement value logging. The modules are designed in such a way that all components are mounted on a common cooling element. For completion of the traction circuit, the IGBT chopper module is equipped with additional components such as the power choke and power contactors. Existing components can be reused.

The IGBT chopper module contains a central CCM control unit (Chopper Control Module) for the realization of the regulation and control inside the chopper. It calculates the accentuation signals of the IGBTs in accordance with the external set values as well as the operation mode. At the same time it also takes the speed and the line voltage into consideration.

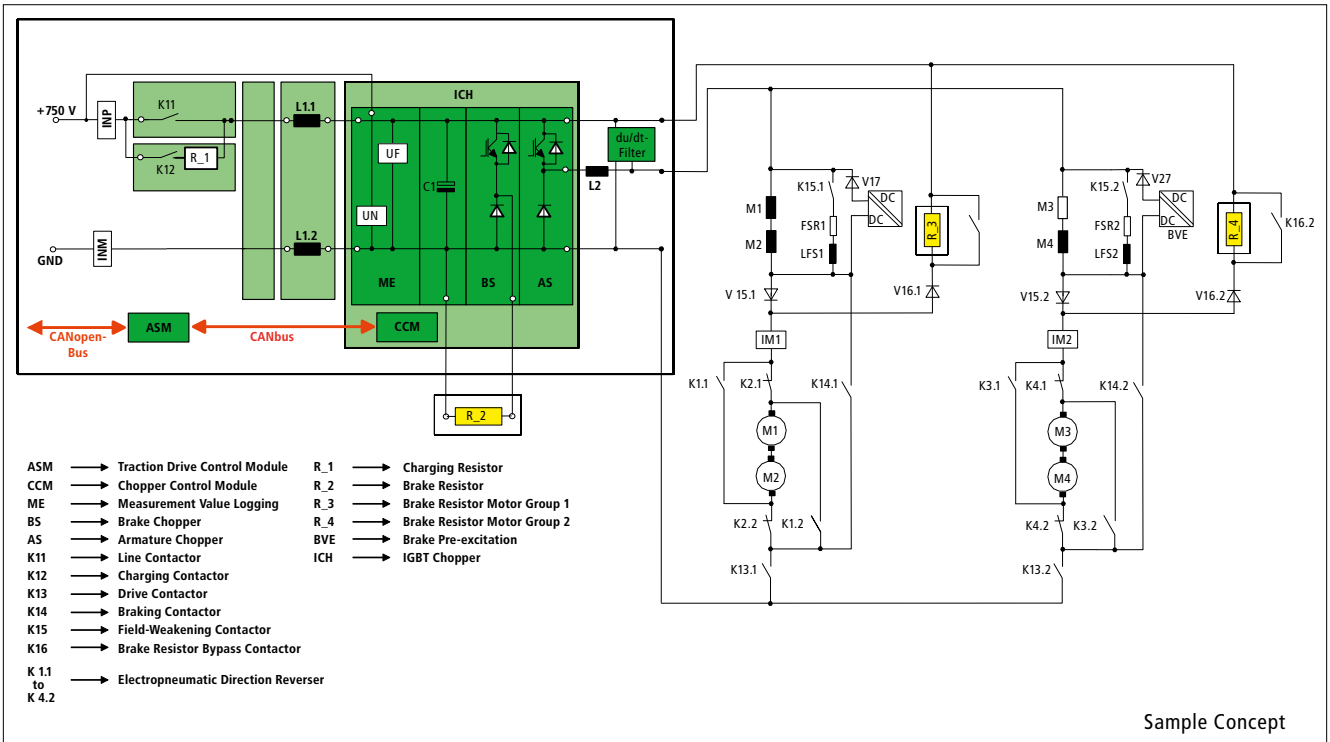
Additionally, all of the chopper's monitoring functions are carried out by the CCM. The CCM is connected to a so-called ASM (Drive Control Module) for the reading-in of vehicle control commands. The ASM serves as an interface between the actual drive control and the vehicle control system. The ASM can also be connected to additional internal assembly modules via a CANopen connection.

Dimensioned Drawing

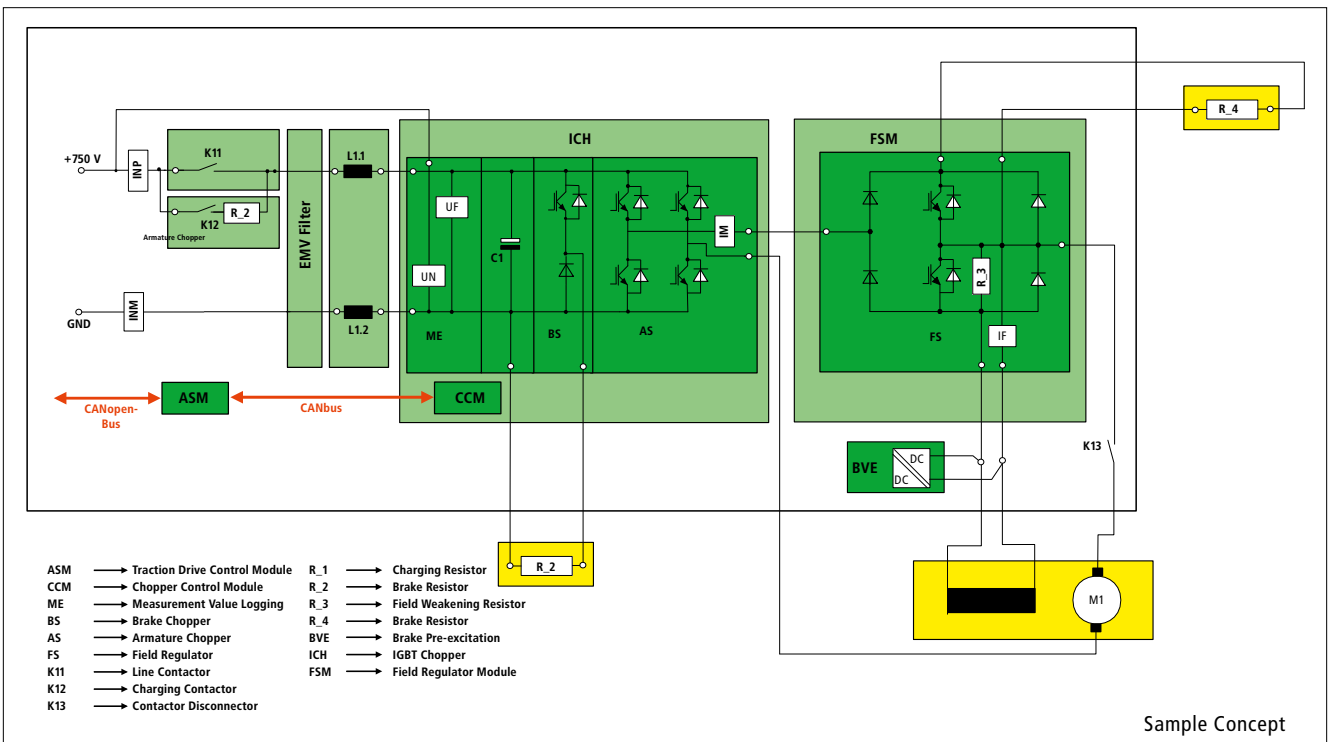


Sample Dimensioned Drawing of an IGBT DC Chopper

DC Chopper-Concepts



DC Chopper concept for supplying four in cross-connected traction motors



DC Chopper concept for supplying a traction motor



Tramcars Geneva, Switzerland

Vossloh Kiepe supplied 92 chopper modules using modern IGBT technology for the modernization of the 46 six/eight axle tram motorcars belonging to Transports Public Genovis (TPG).



Underground Rail Vehicles Philadelphia, PA, USA

The Southeastern Pennsylvania Transportation Authority (SEPTA) are restoring their B-IV vehicle fleet which is now over 25 years old. SEPTA ordered 127 new IGBT chopper

traction systems in order to equip the vehicles (that were still using cam shaft control assemblies) with modern drive technology.



Light-rail Vehicles (B Wagon) Bonn

The Stadtwerke Bonn GmbH ordered 50 modern IGBT choppers from Vossloh Kiepe for the modernization of the drive train of 25 B100S series light-rail vehicles. This modernization included replacing each of the cam

shaft control assemblies with two IGBT choppers. In addition Vossloh Kiepe supplied the corresponding brake resistors and drive controls.



Tramcars Mülheim an der Ruhr

Verkehrsbetriebe Mülheim ordered 22 modern choppers for the modernization of the drive equipment for eleven M6 S and/or M8 S series light-rail articulated railcars.



EL2 Electric Locomotives Cottbus

Deutsche Bahn AG Fahrzeuginstandhaltung Werk Cottbus (DB AG Cottbus) and Vossloh Kiepe worked together in order to modernize 53 EL2 four axle mining electro-locomotives operated by Lausitzer Braun-

kohle AG (LAUBAG) located in Senftenberg. The IGBT DC choppers as well as all other electrical components were also delivered by Vossloh Kiepe.



Tramcars Cottbus

Verkehrsbetriebe Cottbus ordered 26 modern IGBT chopper sets from Vossloh Kiepe for the modernization of 26 Tatra KT4D articulated railcars.