

## DC-Bus Sharing with AKD and AKD-C Drives

This application note describes how to use DC bus link (X3) on AKD and AKD-C Drives. Valid for AKD models HV3 to AKD HV24 and AKD-C Drives.

The DC bus link can be connected in parallel so that the regen power is divided between all drives that are connected to the same DC bus link circuit. Every drive must have its own power connection to mains voltage when the DC bus link is used. Drives working regeneratively should be placed beside other drives which require energy to help reduce current flow over long distances.

**NOTICE**

Use 6mm<sup>2</sup> unshielded single cores with maximum length of 200 mm. For longer lengths use 6mm<sup>2</sup> shielded cables. No Additional fusing for wire protection is required.

**NOTICE**

Drives can be damaged if DC bus link voltages are different. Only drives with the mains supply from the same mains (identical mains supply voltage) may be connected to the DC bus link.

**NOTICE**

Connection to Servostar drives S300, S600, and 700 are not allowed.

**NOTICE**

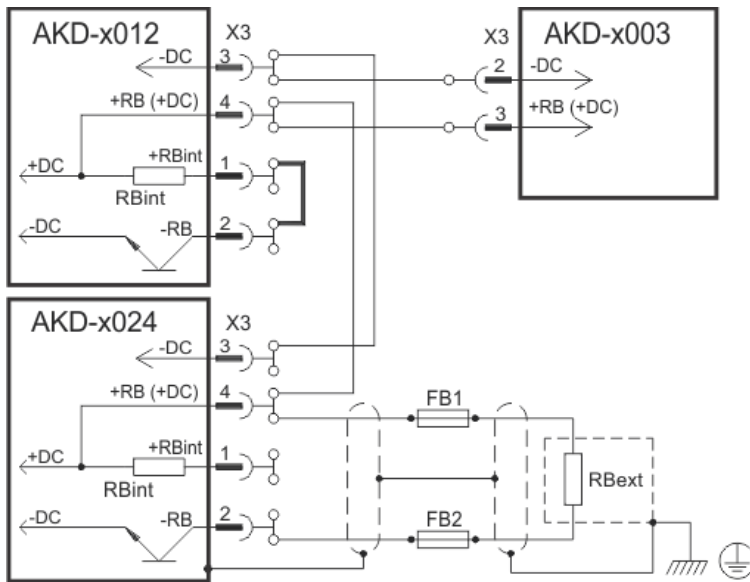
The phase lost/main control does not work on DC-Bus connected drives. Phases lost on a single drive using a DC-Bus connection are not detected. External phase monitoring to prevent overload of the rectifier is recommended.

For applications, this is a cost effective way to reuse energy which is generated by the servomotor in a larger DC bus links. Additionally the internal electrical brake power can be increased. The maximum possible internal brake power is 80% of the sum brake power of all connected single brake resistors.

If more brake power is required, an additional external brake resistor must be connected to one of the servo amplifiers; preferably the one with the biggest brake power. The maximum possible brake power is 80% of the sum of all connected brake resistor powers.

## DC Bus Topology with Y Connectors

Various configurations are possible for DC bus linking. In the following example a 24A amplifier (left) can be connected to any AKD HV3 to AKD HV24 or AKD-C drive (right) at the same time.

**NOTICE**

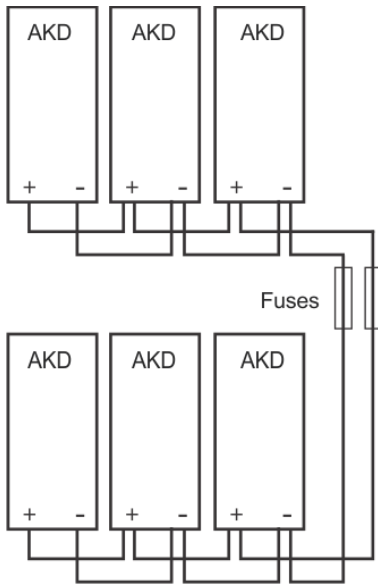
The sum of the rated currents for all of the drives connected in parallel to an AKD must not exceed 48 A. These guidelines must be observed otherwise situations could occur where connectors can become overloaded.

In accordance with the above notice, if the upper current limit is not exceeded, these amplifiers can be connected with 6mm<sup>2</sup> connections using a Y connector.

DC bus links do not need to be fused in standard operations. This means, however, that there is a risk that devices can be damaged or destroyed if one device in the group fails, such as by an internal short circuit.

The risk of a fault is quite low. Based on a cost-risk estimate, you may choose to forego the use of safety devices when only two or three servo amplifiers are switched in parallel.

To prevent system damage, adding fuses between groups of amplifiers is recommended if several amplifiers are connected in parallel. For example, a group can consist of two, three, or four amplifiers depending on the current class. Note: fuses cannot avoid damage under all conditions.

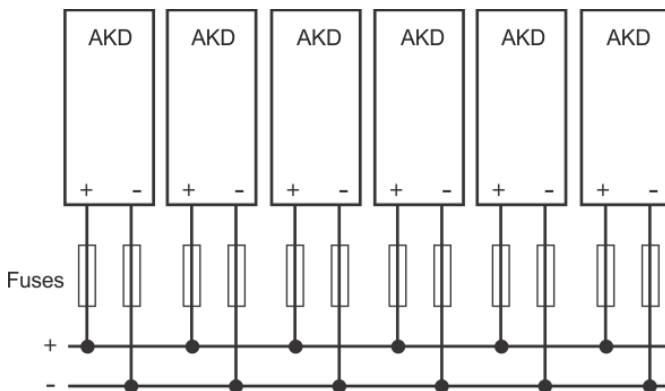


## T Connectors Using Bus Bars

If one device breaks due to a short circuit, then only its fuses are damaged. All other devices will continue to function normally. Note: using large bus bars can lead to a higher current than demonstrated in the previous example because the equalizing current does not pass through the connectors. Therefore, several amplifiers can be operated in parallel. This type of connection is useful for regeneration devices.

**NOTE**

This wiring does not require Y connectors.



## Fuse Types and Holders for UL Regions

| Fuse Type  | Fuse Holder            |
|--|------------------------|
| <b>Bussmann</b> FWP-50A14F<br>Size 14 x 51mm with 800Vdc UL approval | <b>Bussmann</b> CH142D |

## Fuse Types and Holders for CE Regions

| Fuse Type   | Fuse Holder (Two Poles, Finger Safe) |
|---|--------------------------------------|
| For mains 400VAC to 480 V AC:<br>E.g. class aR 50A from Siba<br>Size 14 x 51mm DC 700V, 30/50kA                       | Siba: 14 x 51mm (Part: 51 058 04.2)  |
| For mains 110V AC to 240V AC:<br>E.g. class gRL 50A (gS) from Siba<br>Size 22 x 58mm AC 690/700V and DC<br>440V, 30kA | Siba: 22 x 58mm (Part: 51 060 04.2)  |