*Note! All data sheets and commissioning instructions are available on our homepage at **www.peter-electronic.com**.*

Dimensioning of pre-fuses:

The pre-fuses F can be dimensioned by means of the following instructions.

Basically, two types of fuse protection are available for the user.

1. Fusing according to allocation type „1“, DIN EN 60947-4-2.
   After a short circuit, the device is allowed to be inoperative and repair work is possible.
2. Fusing according to allocation type „2“, DIN EN 60947-4-2.
   After a short circuit, the device must be suitable for further use. However, there is the danger that the contacts of the by-pass or braking relays weld. Therefore, if possible, these contacts are to be checked prior to reconnecting the device to the supply. If this check cannot be carried out by the user, the device has to be returned to the producer in order to have it checked.

The following dimensioning information refers to the below operating conditions:

- Use of standard asynchronous motors
- Standard starting and/or braking times
- Switching frequency not exceeding the value indicated in the data sheet

Fusing according to allocation type „1“:
As pre-fuses, we recommend to use line protection fuses (utilization category gL) or automatic circuit-breakers with type K tripping characteristic. In the case of automatic circuit-breakers, the tripping characteristic of the type series is to be taken into account when protecting the soft start section. With 2x I_n the tripping time should be at least 20s (I_1).
Taking into account the maximally occurring starting current (normally up to the 5-fold rated device current of the starting section) and the maximally occurring braking current (normally the rated device current of the braking section), we recommend fuse values according to table 1, column 4, for the device series MINISTART.
In the case of the device series VersiComb II, the soft start and the braking section are separately supplied with power. For this type series, we recommend fuse values according to table 2, column 4 for the starting section, and column 5 for the braking section.
In the case of special devices having increased starting or braking times, the recommended fuse value may have to be adapted.

Note! Wiring cross-sectional area according to DIN VDE 0100-430, DIN EN 57100-430.

Fusing according to allocation type „2“:
The power semiconductors are to be protected by fuses of the utilization category gR (semiconductor fuses, high-speed fuses). However, since these fuses do not ensure line protection, it is necessary to use additionally line protection fuses (utiliz. category gL).
To protect the semiconductors it is necessary to select gR-fuses featuring cutoff-I^2t-values which are approx. 10-15% below the I^2t-value of the power semiconductor (see technical data).
In this connection, the ampere-value of the selected fuse should not be smaller than the starting current to be expected for the soft start section and the braking current to be expected for the braking section.

PETER electronic does not prescribe the use of semiconductor protection fuses. However, for some UL- or CSA-listed devices there are exceptions which are indicated in the relevant commissioning instructions.

Notes

- *On the basis of the I^2t-value of the power semiconductors, the starting time, possibly the max. starting current, braking time, braking current and switching frequency, the fuse supplier is able to select a suitable type. Due to the great variety of producers, sizes and types, PETER electronic does not recommend any particular fuses.*

- *If the value of the fuse or the cutoff-I^2t-value is selected too small, it may happen that the semiconductor fuse reacts during the starting phase or during braking.*

Table 1

Rated device current Starting section (techn. data)	Rated device current Braking section (techn. data)	Device type	Fuse value, allocation type 1
4A	7,5A	MINISTART 1,5B	10A
6,5A	15A	MINISTART 3B	16A
12A	22A	MINISTART 5,5B	20A

Table 2

Rated device current, Starting section (techn. data)	Rated device current Braking section (techn. data)	Device type	Starting section Fuse value in the case of allocation type 1	Braking section Fuse value in the case of allocation type 1
12A	25A	VCII 230-3 VCII 400-5,5	20A	20A
15A	35A	VCII 230-4 VCII 400-7,5	25A	25A
25A	45A	VCII 230-5,5 VCII 400-11	35/40A	35A
32A	55A	VCII 230-7,5 VCII 400-15	50A	40A

Table 3

Rated device current Starting section (techn. data)	Rated device current Braking section (techn. data)	Device type	Fuse value, allocation type 1
16A	20A	VBMS 400-2,2	16A
16A	20A	VBMS 230-1,5	16A