

Dimensioning Rules for Soft Starters 1.19

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

Dimensioning of pre-fuses:

Pre-fuses F can be dimensioned according to 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 soft starter 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 relays (-contactors) 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 acceleration and/or deceleration times

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. With $2x I_n$ the tripping time should be at least 20s (I_n).

The fuse values are to be determined by taking the conductor cross-sectional area of the wiring into account. Depending on the rated motor current, the maximally occurring starting current (normally up to the 5-fold rated device current) and the starting frequency the wiring cross-sectional area is to be determined. Table 1 shows the values for numerous applications, i.e., with a 3-fold nominal current as mean starting current and a maximum starting time of 10s. In the case of parameter values exceeding these values, it may be necessary to adapt the fuse value accordingly.

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 current-value of the selected fuse should not be smaller than the starting current to be expected.

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.

Note 1! On the basis of the I^2t -value of the power semiconductors, the starting time and possibly the max. starting current, 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.

Note 2! 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 deceleration.

Note 3! In the case of special devices having increased starting or deceleration times, the recommended fuse value may have to be adapted.

Table 1

Column 1	Column 2	Column 3	Column 4
Rated device current (techn. data)	Device type	Fuse value in the case of allocation type 1	Starting frequency Starts / h
3.5A / 4A	DUOSTART, MICROSTART, MINISTART	10A	90
6.5A	DUOSTART, MICROSTART, MINISTART, VSII	10A	40
12A	DUOSTART, MINISTART, VSII	20A	60
15A / 17A	VSII, DAS-T	25A	40
25A	MINISTART, VSII, DAS-T	35/40A	30
32A	VII	50A	20
45A / 48A	VSII, DAS-T	63A	20
63A	DAS-T	80A	40
75A	DAS-T	100A	40
88A	DAS-T	100A	20
105A	DAS-T	125A	20

Determining the permissible starting frequency:

Taking the maximum starting current and the selected starting time into account, the following tables can be used to determine for each device type the permissible maximum starting frequency per minute.

Diagram 1

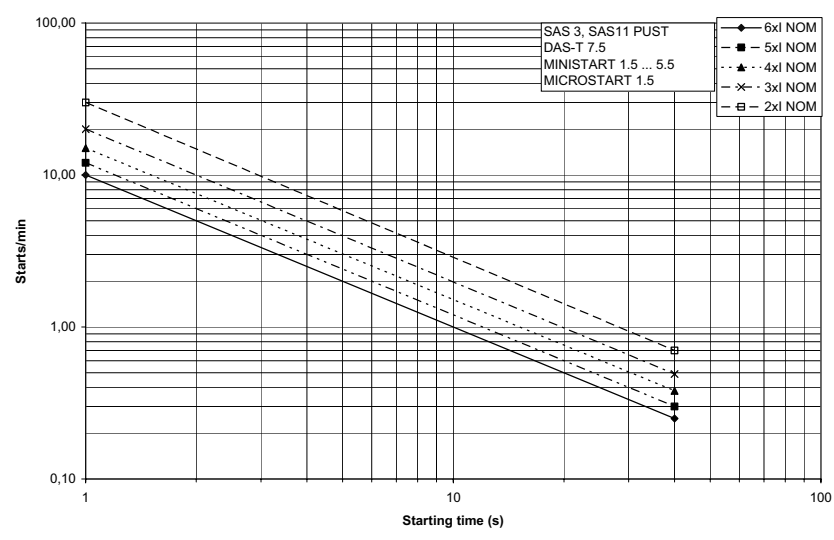


Diagram 2

