Economical cable design - Calculation instructions

Guidance information

[Information within brackets in this document refers to local regulations**]**

The purpose of these instructions is to provide users with a simple tool for calculating and choosing economical cable areas.

The present version mainly differs from the previous one in that the layout and the price of energy used in the example under paragraph 2 has been changed.

Contents

1 Introductionen

The choice of cable area for a specific operational state is not determined exclusively by the current carrying capacity and method of construction of the cable in accordance with national standard (SS 424 14 24); economic valuation must also be given serious consideration. Reference is made here to an “economical cable area” which means that, apart from the price of the cable and the cost of installation, its losses are also evaluated and included in the comparative cost.

2 Loss evaluation

The costs of losses are dependent on the assumed service life of the plant, the annual period during which the losses are incurred, the cost of energy and the discount rate. When the values of these factors have been input, the capitalised present value of the losses can be determined. In other words: What is the value today of the costs of the losses which are incurred annually over a certain number of years?

The calculation is made using the formula

Kf = p x k x f

Kf = capitalised value, SEK/m
p = capitalisation factor from the table in See section 3,
k = energy charge, SEK/kWh
f = factor for cost of losses, page 3 and page 4

Note *The relationship between the period during which the losses are incurred (Tf) and the utilisation period of the load (Tb) is obtained from the formula*

$$T_f = 8760 \times 0{,}13 \left(\frac{(T_b)}{8760} + 0{,}87 \left(\frac{(T_b)}{8760} \right)^2 \right)$$