

Monitoring and protection of motors and machinery.

Protection of motors and machinery are normally made by means of motor switches or the like, but in many applications, f.inst. if you need a quick reaction in connection with overload, or an alarm in case of underload, it is an advantage to use a monitoring relay.

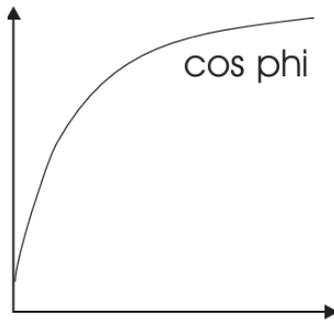
Please note, that the monitoring relay cannot replace the mandatory motor switch, which is used for safety reasons.

On the figures below you can see, how the different parameters are influenced by the motor load, and which C-mac® relays to use for various applications.

The descriptions must be understood as rules of thumb and they are not necessarily correct in all applications as well as the curves are only intended as guide and not covering all motor types.

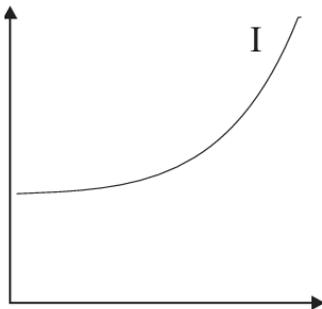
There are C-mac® relays that can be used if you want an interruption, or converters that can be used if you want an analog signal, possibly in connection with PLC or PC controls.

Fasevinkel ($\cos \phi$)



The phase angle between current and voltage ($\cos \phi$) is changing a lot between 0 and 60% load, therefore it is an advantage to monitor the phase angle if you want an alarm in connection with underload, f.inst. breakage of belts, pumps running dry, blocking of filters, etc.

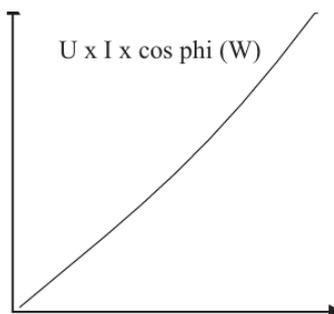
Motorstrøm



The current consumption of a motor is almost the same from 0 to 50% load, and after that it will increase with increasing load.

Current monitoring is used, if you want to protect the motor against blocking, f.inst. grinding mills, screw conveyors, etc.

Motoreffekt



With power monitoring you can monitor all variables (supply voltage, current and phase angle), ensuring a very high sensitivity to even very small load changes, making this principle preferable for both over- and underload monitoring.