Modul 2.9

EMC

Electro Magnetic Compability

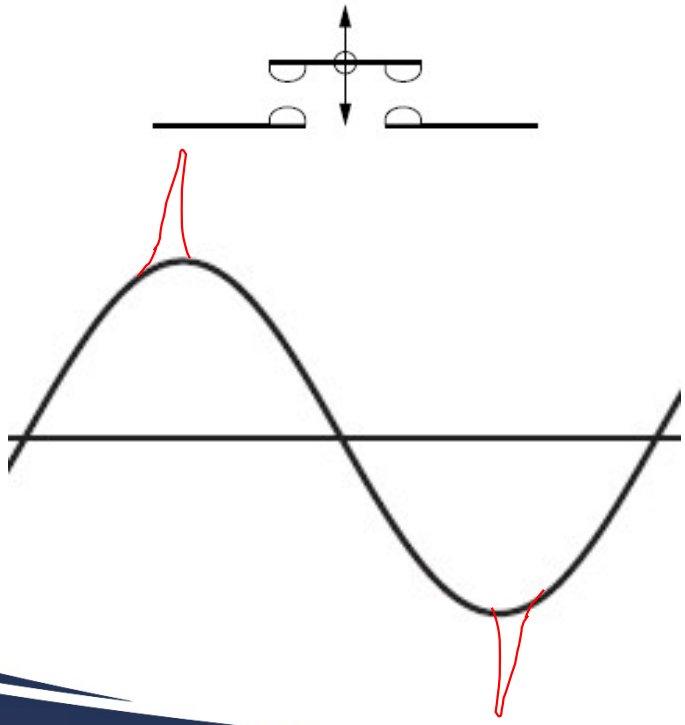
ELEKTROMAGNETISK

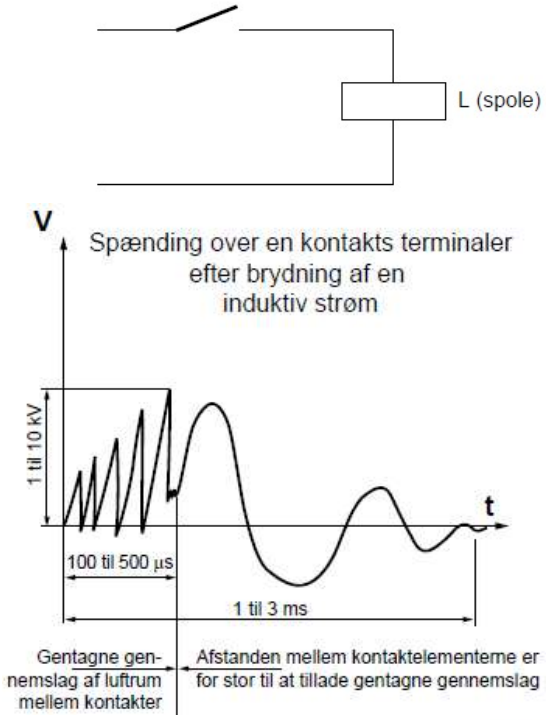
KOMPATIBILITET

EUC SJÆLLAND

Modul 2.9

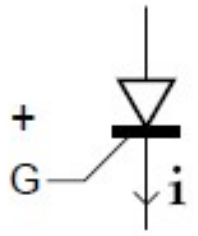
Ind og udkobling af mekaniske komponenter bevirker transienter



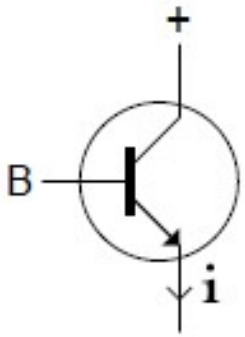


Modul 2.9

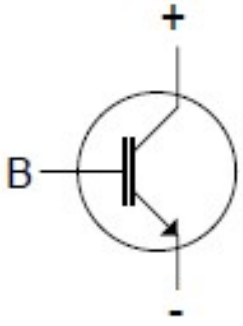
Ind og udkobling af elektroniske komponenter bevirker transienter



Thyristor



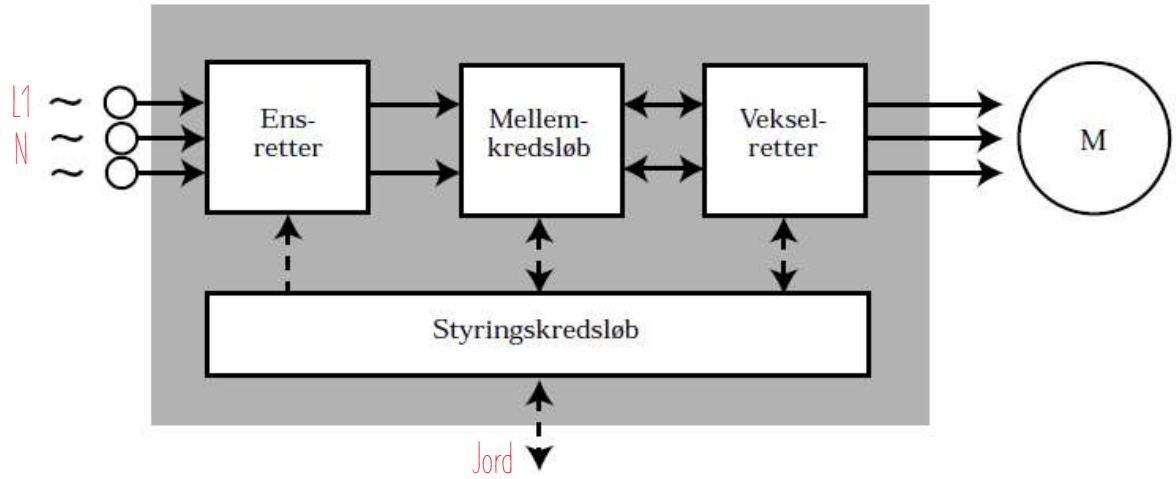
Transistor



IGBT

Modul 2.9

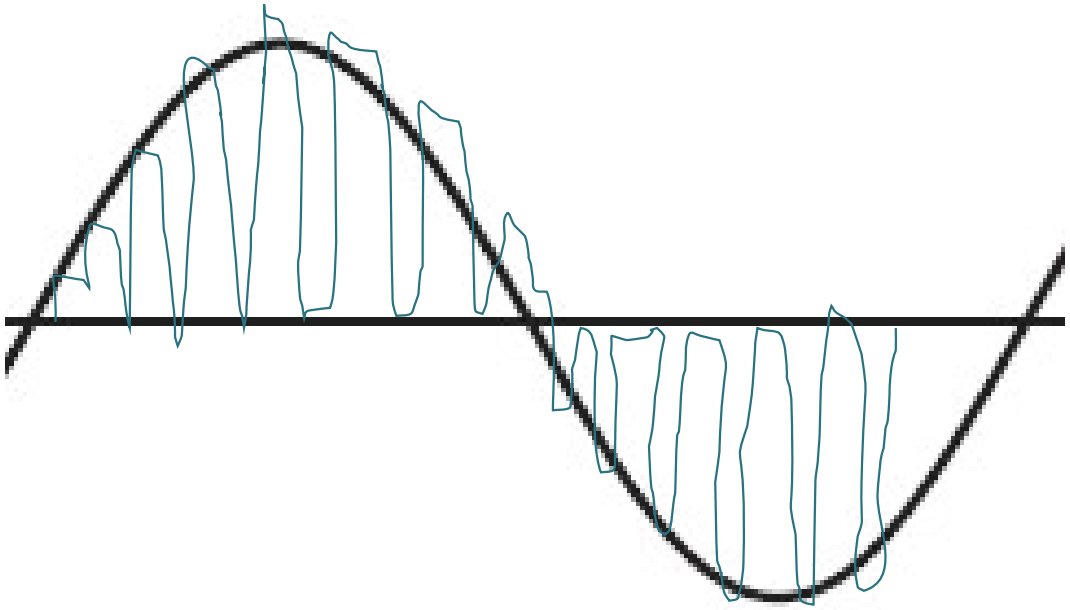
Typisk funktion af Frekvensomformer



Op til 2,2 kW motor effekt er forsyningen typisk L og N, altså 230V
Og elektronikken former 3*230V til motor

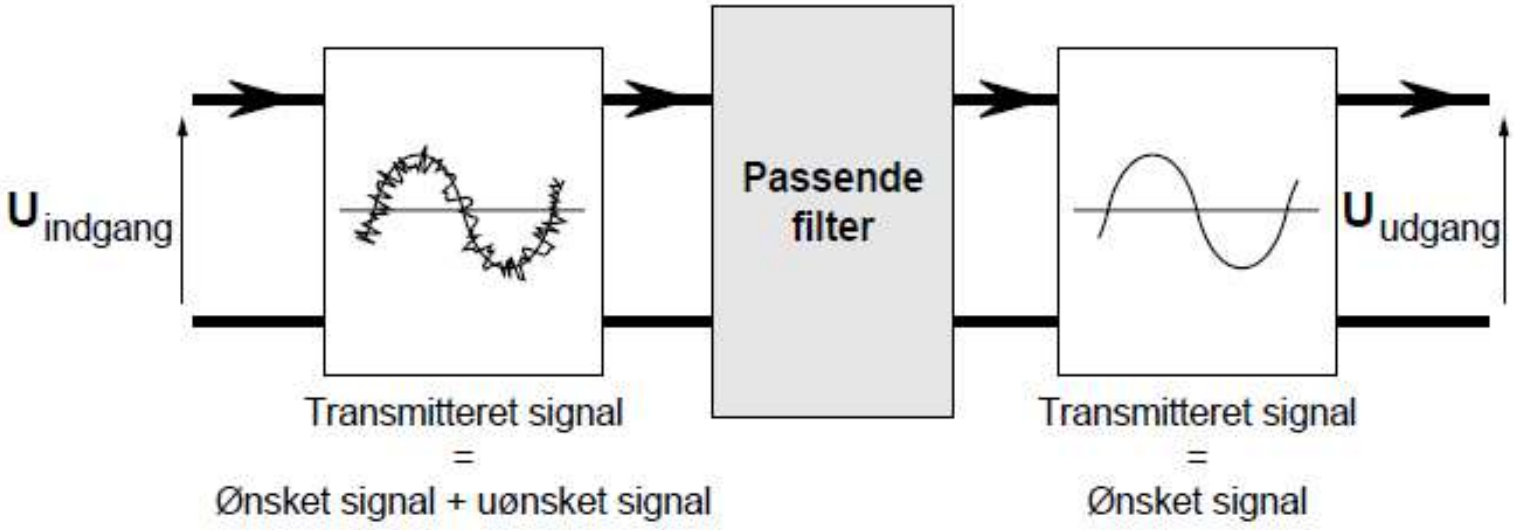
Over denne effekt er der brug for 3*400V til forsyning

En frekvensomformer støjer

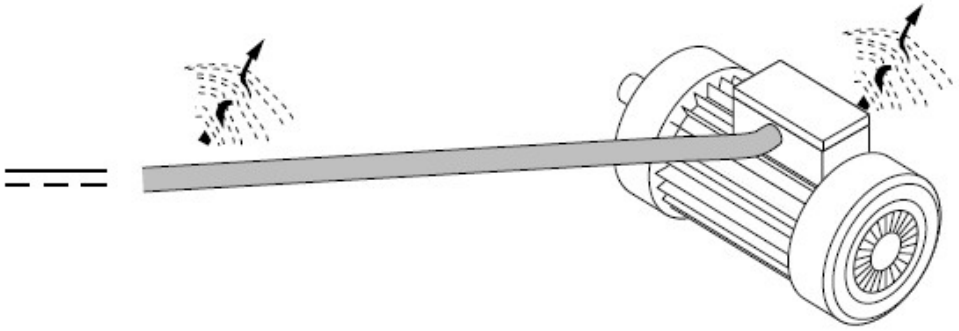


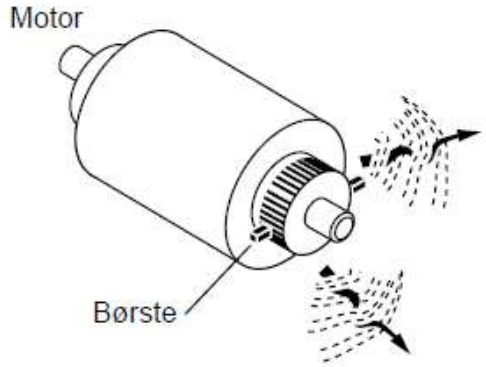
Switching frekvens = 4 kHz ved Altivar 12

Et støjfilters funktion

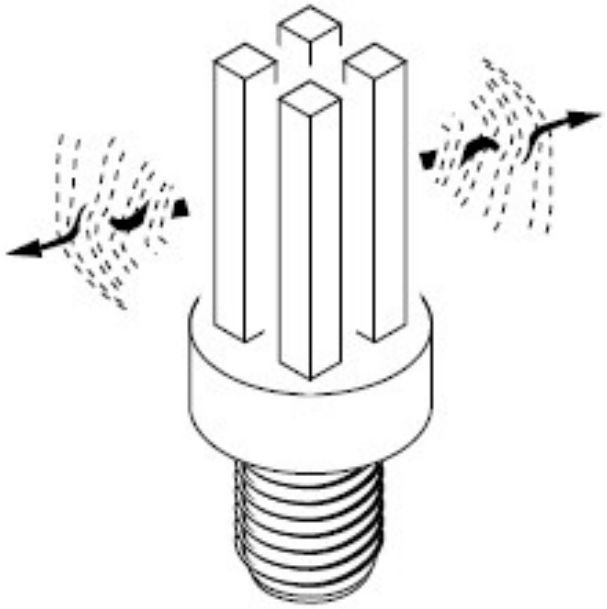


DC motor med kommutator





Fluorescerende belysning

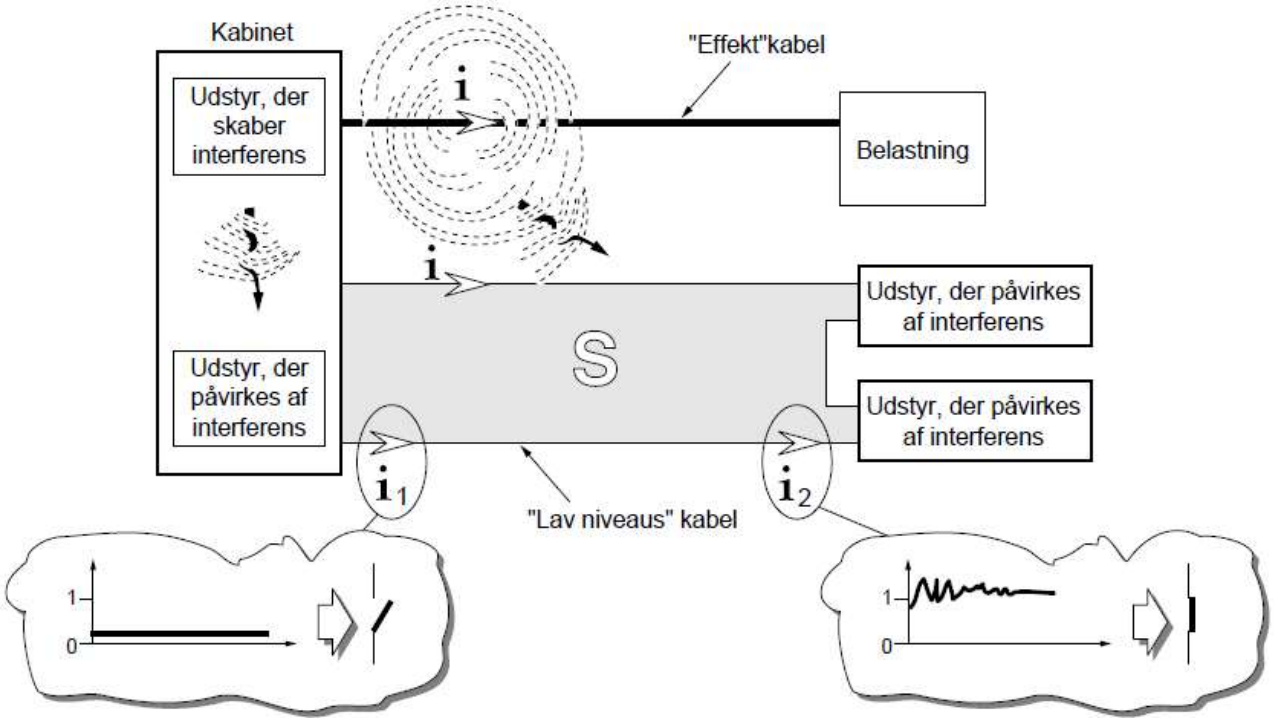


Strømmen er ikke sinus formet ved kapasitive belastninger

(Vis evt. R, L og C belastninger på oscilloscope)

Modul 2.7

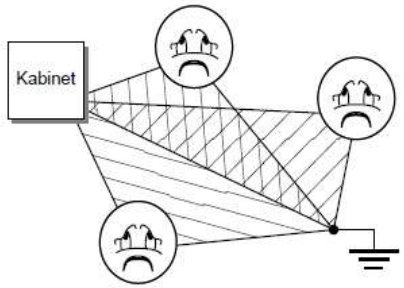
Interferens opstår både inde i styreskabet , men også udenfor ved kabelføring



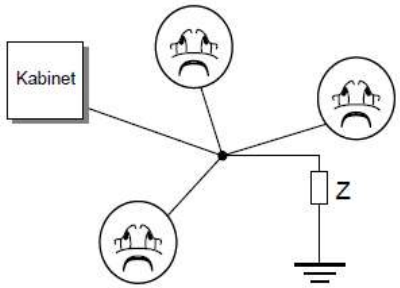
Eksempel med sekvens styring af lys i gartneri.
Styreskab blev flytter 0,5 meter fra effektkabler - derefter OK

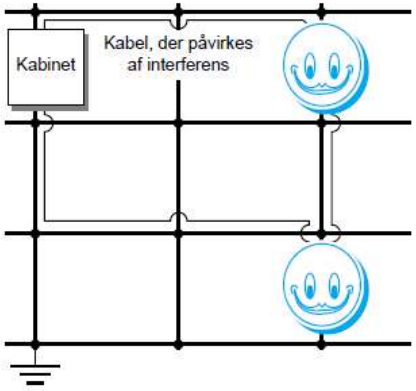
Figur 2.7

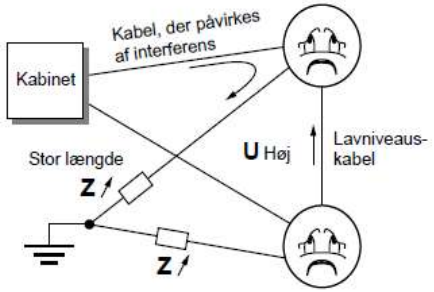
I maskinstyringer, aldrig sløjfe jord videre til næste komponent
Altid træk en særskilt jord i systemet til en fælles jord i hovedforsyningen



Stelforbindelsessløjfer med stort overfladeareal

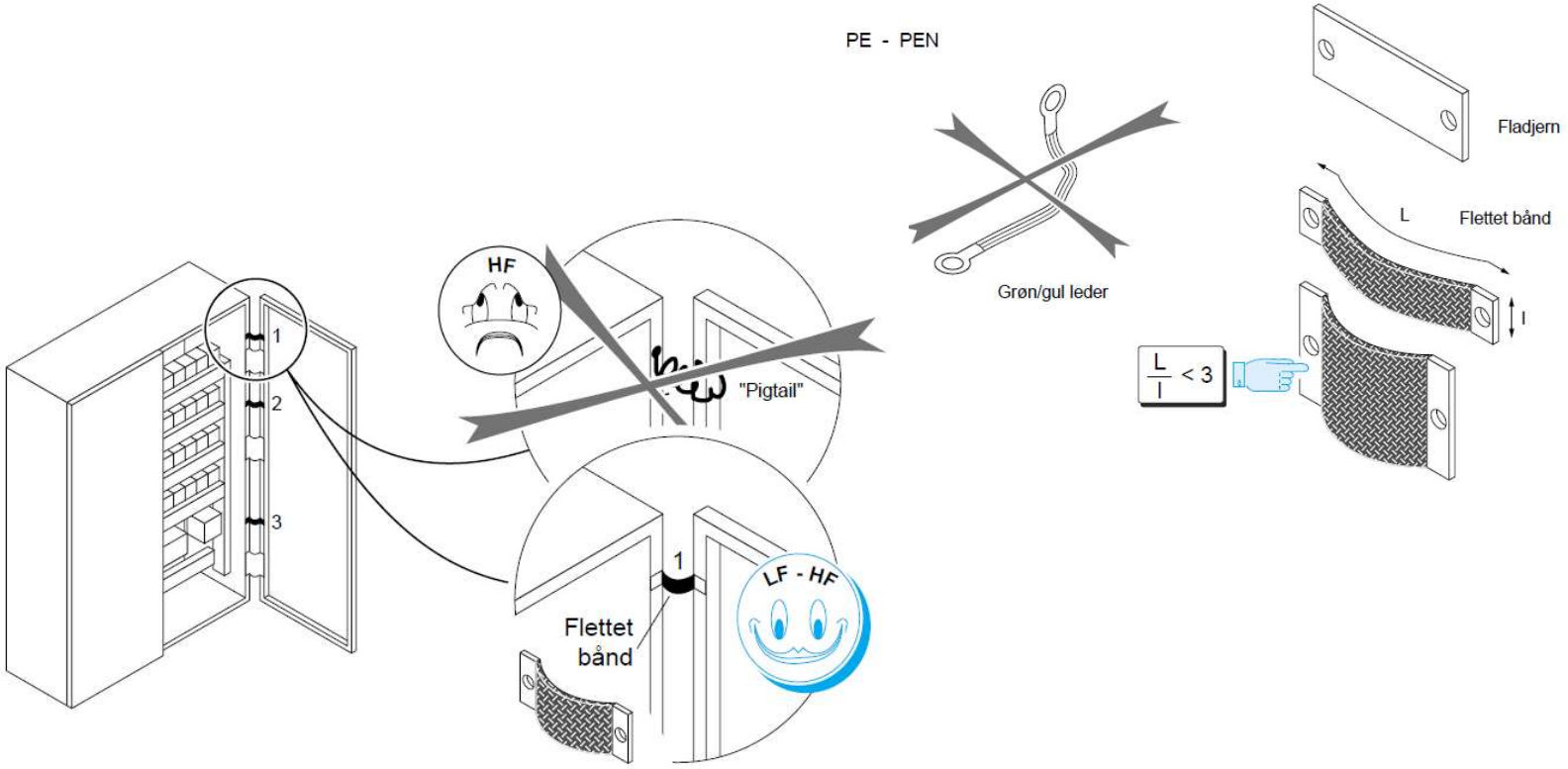




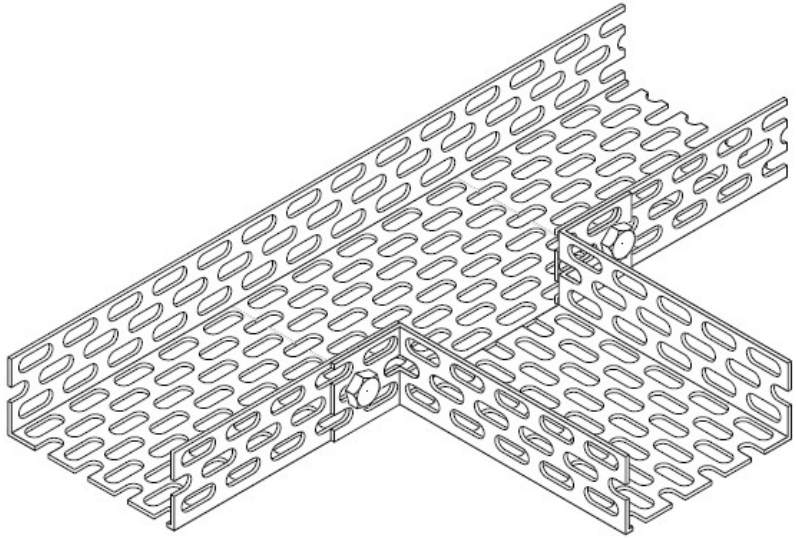


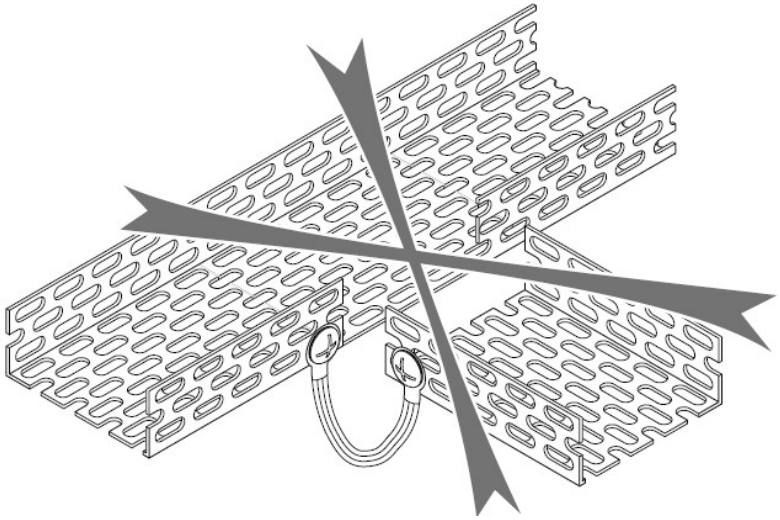
Høj fælles impedans

Låger i styreskabe



Kabel bakker

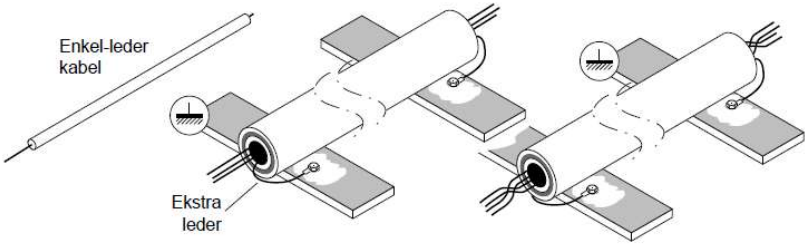




Modul 2.7

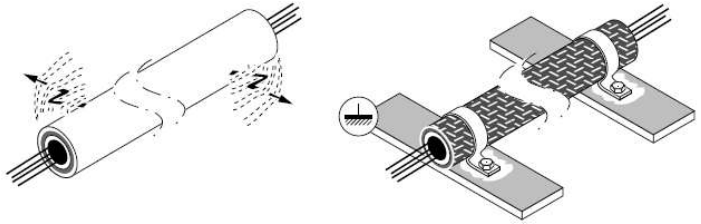
Klasse* 2

Let følsomme signaler



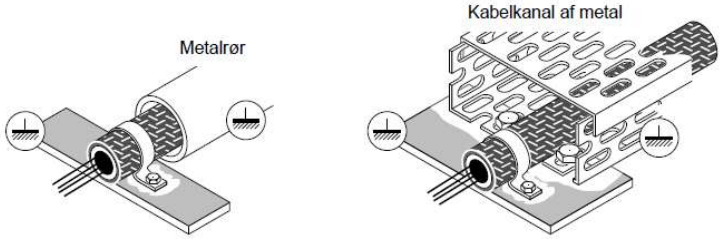
Klasse* 3

Let interfererende signaler



Klasse* 4

Interfererende signaler



Modul 2.7

Skærm tilsluttet i kun den ene ende

- Ineffektiv mod eksterne forstyrrelser i HF elektrisk felt,
- Kan benyttes til at beskytte en isoleret link (sensor) mod LF elektrisk felt,
- Skærm kan fungere som antenne og blive resonant

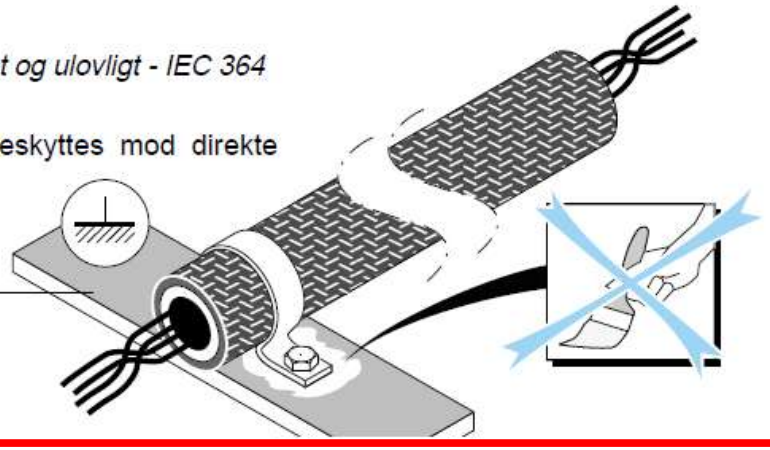
  ==> *i så tilfælde er interferensen kraftigere end uden skærmning!*
- Gør det muligt at undgå (LF) brum,

  ==> *brum forårsages af LF strøm i skærmen.*

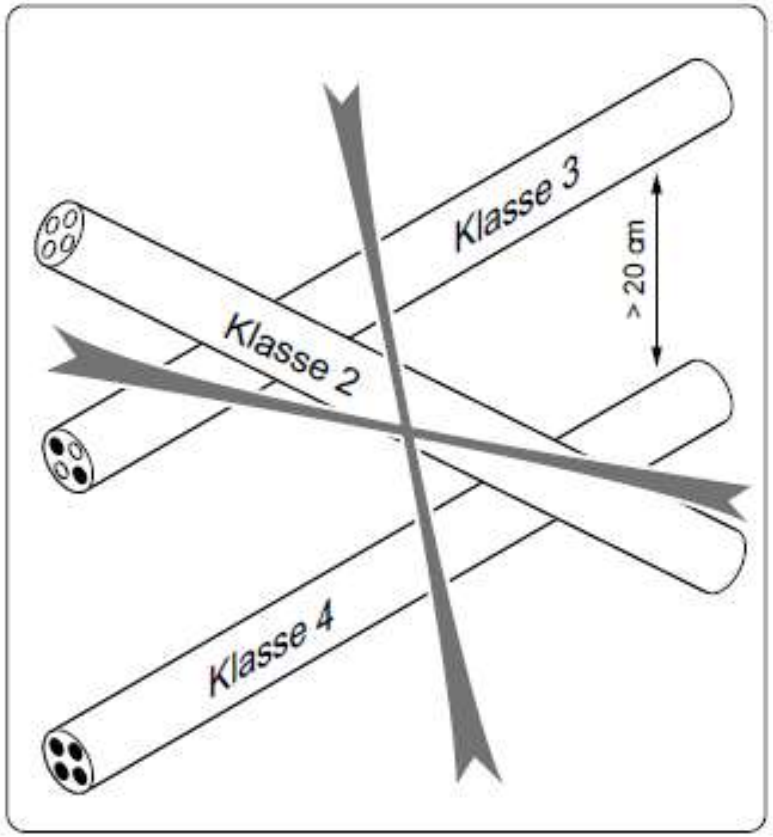
Der kan forekomme en stor potentialeforskel i den ende af skærmen, der ikke er jordet.

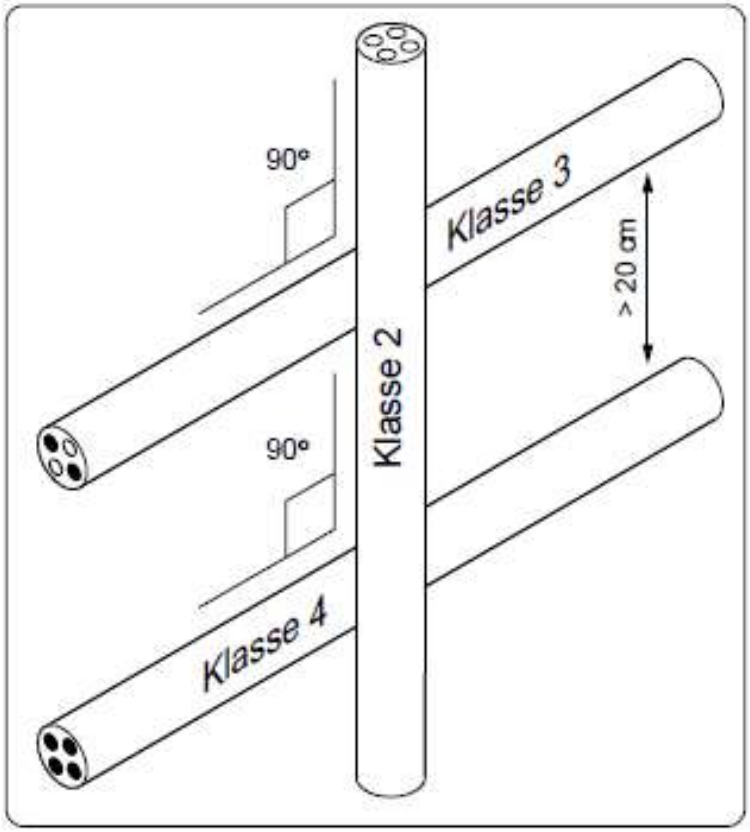
==> *dette er farligt og ulovligt - IEC 364*

Skærmen skal derfor beskyttes mod direkte kontakt.



Kabelføring

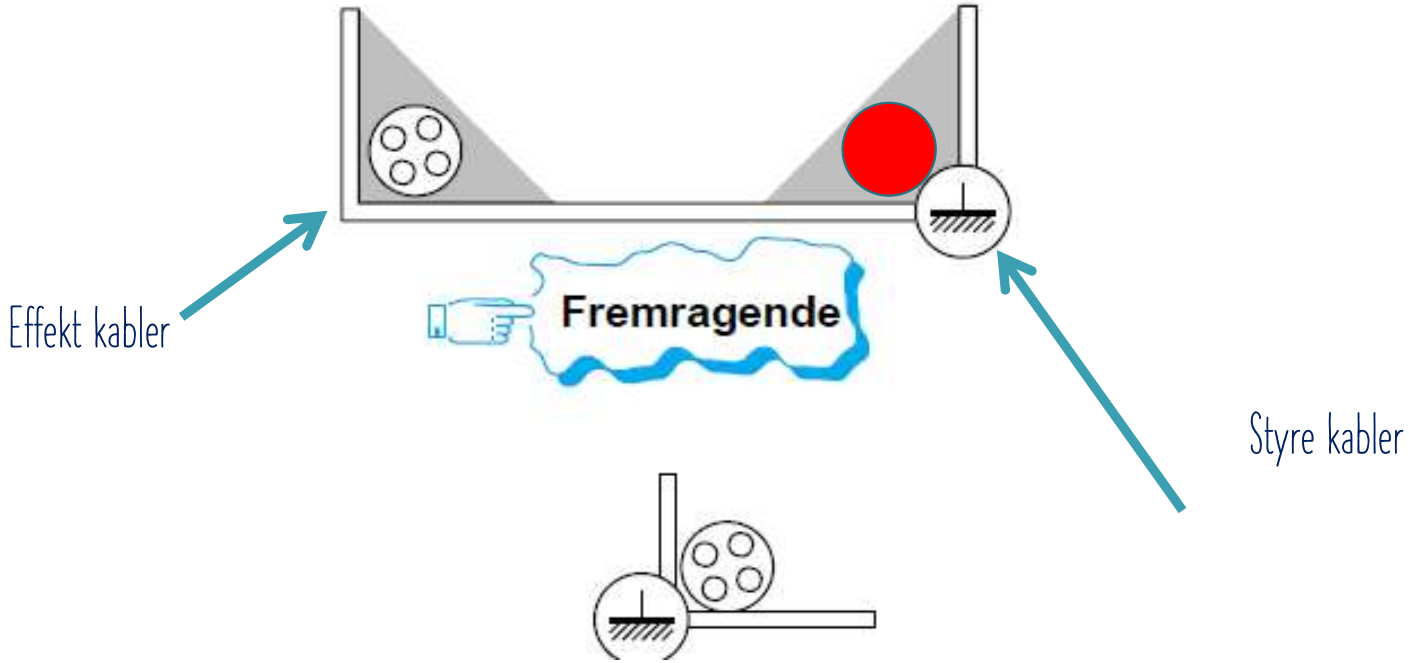




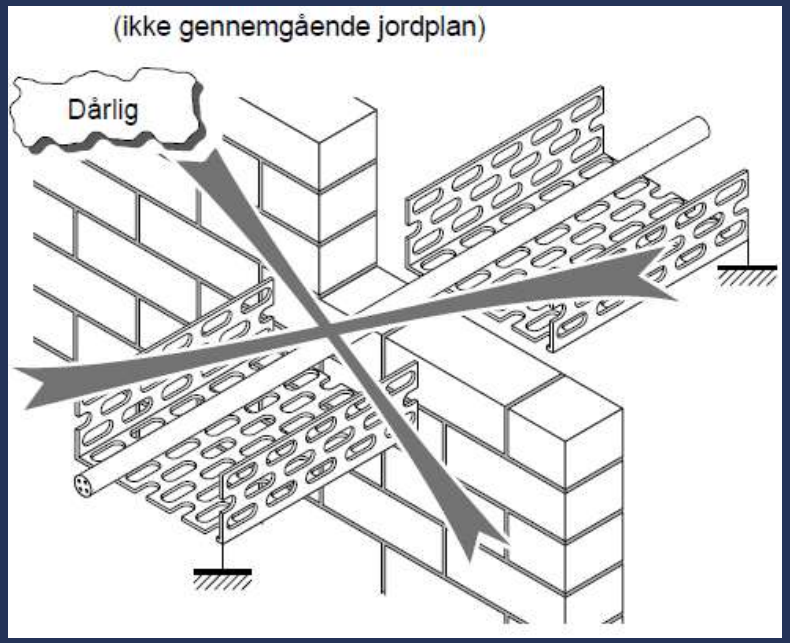
Projekt 2.7

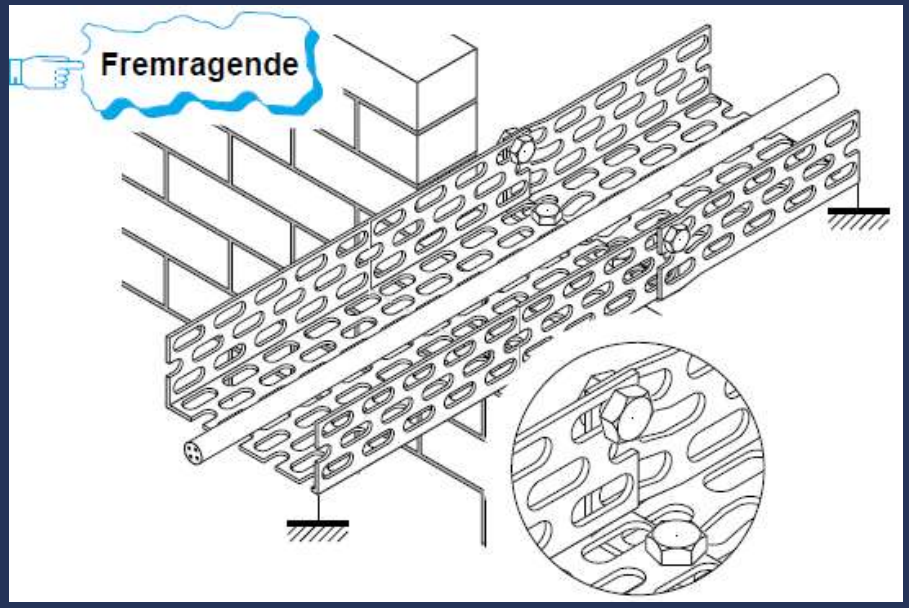
Hold effektkabler fra styrekabler

Modul 2.9

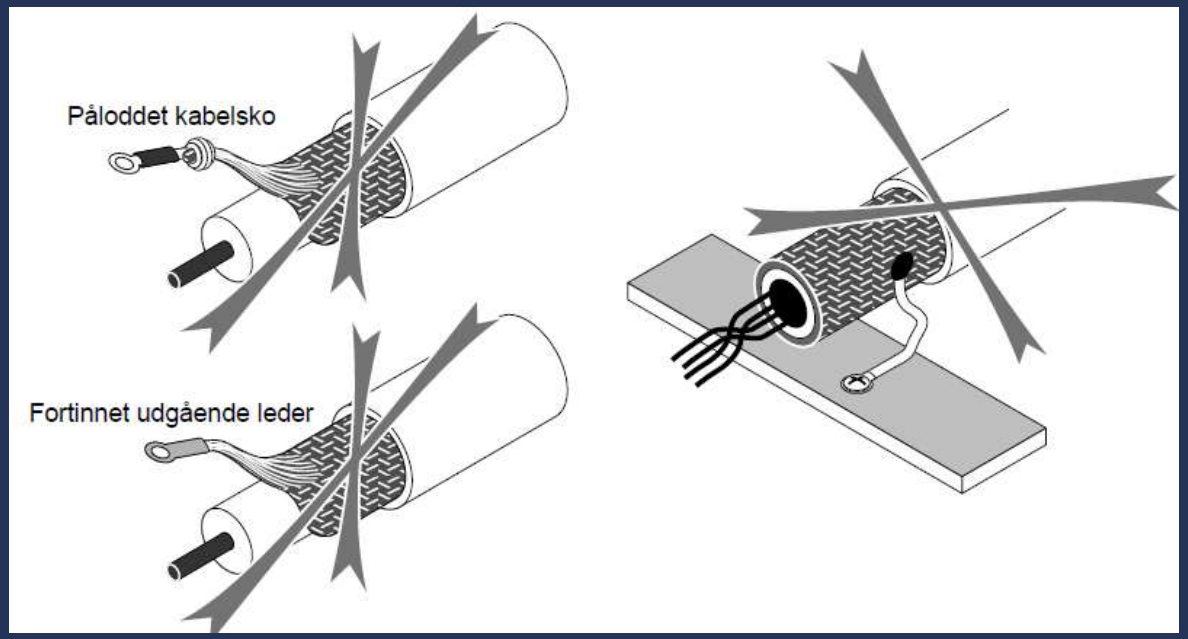


Kabelbakker

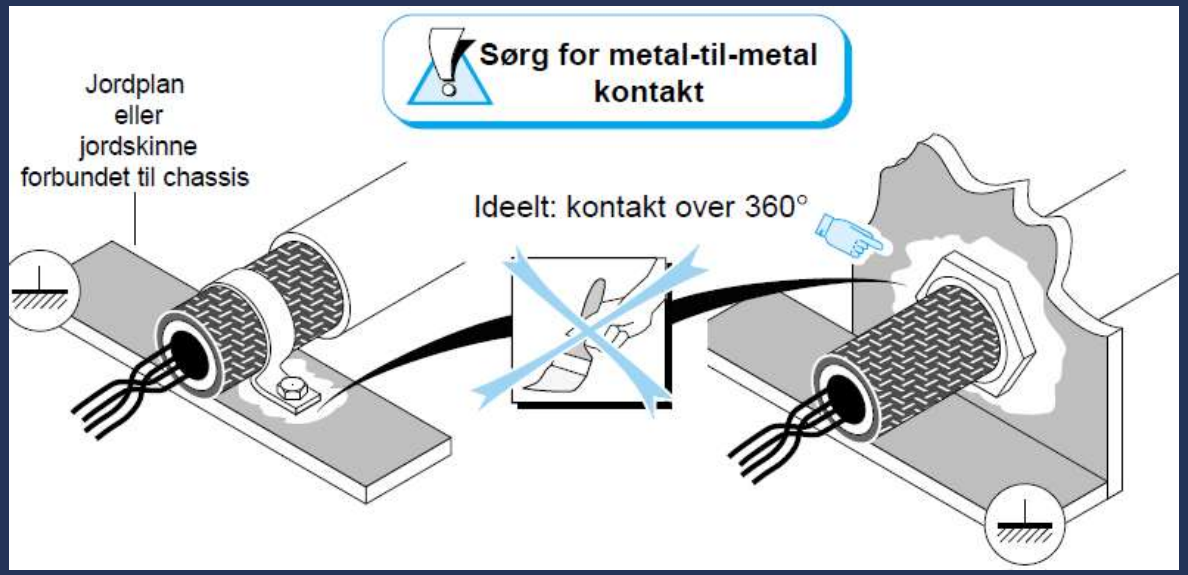




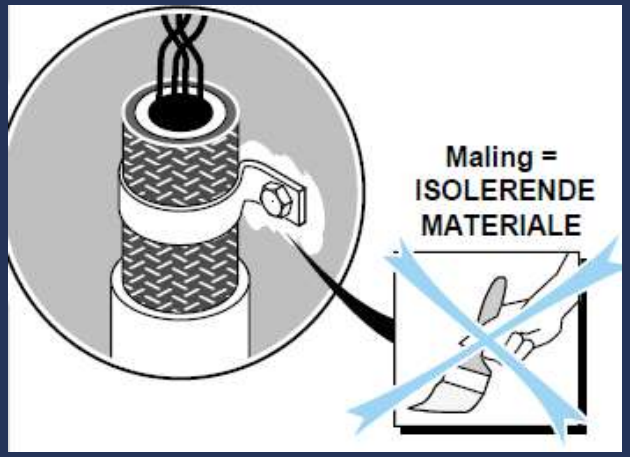
Tilslutning af skærm



Tilslutning af skærm

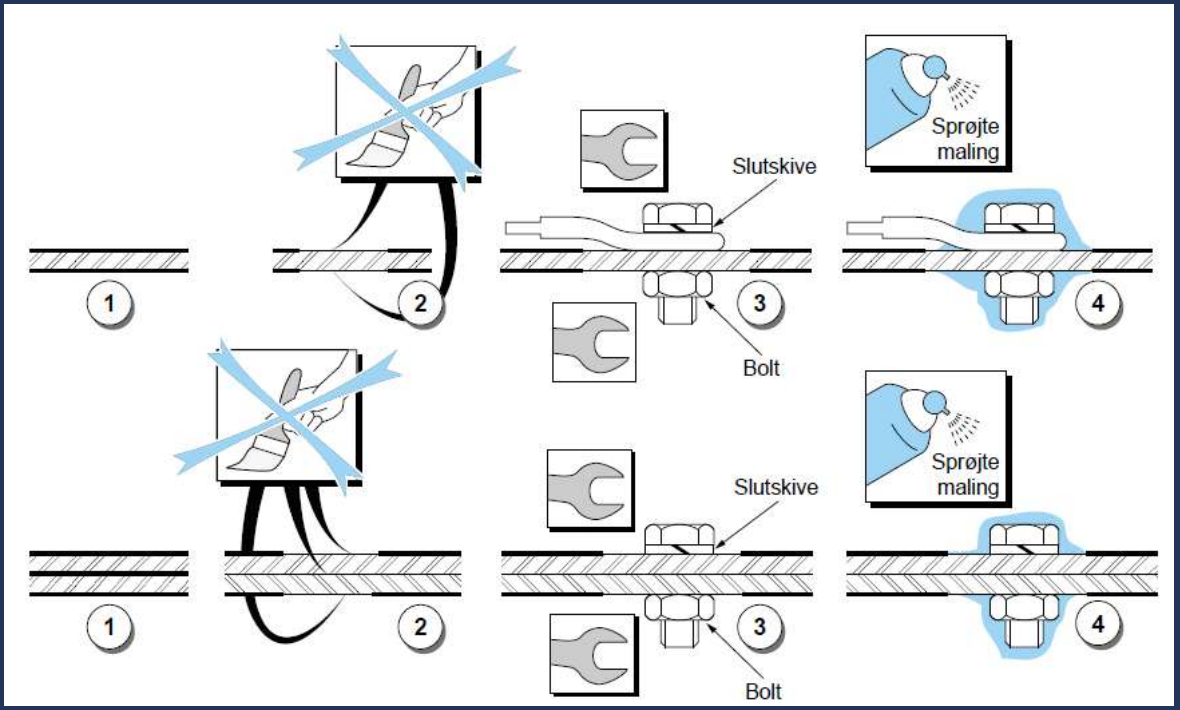


Maling er = med isolerende materiale



Jording ved malede metal flader

Fjern maling til blank metal - Monter forbindelse beskyt mod korrosion ved f.eks. maling



"Slideoverskrift modul 2.9

EUC SJÆLLAND