

## RECOMMENDATIONS FOR COMPLIANCE TO REGULATIONS ON ELECTROMAGNETIC COMPATIBILITY (EMC)

The EMC regulations must be observed when operating the frequency inverter from the public power supply.

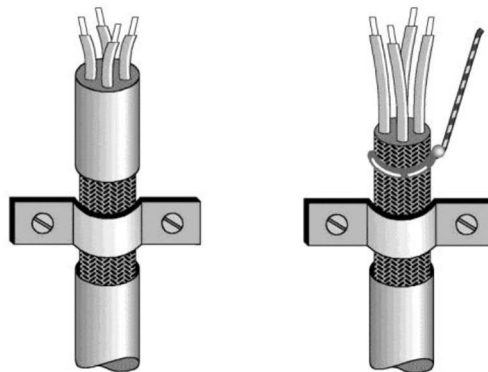
For the following reasons it is very important to adhere to the following EMC recommendations:

- Conformity to the EMC-DIRECTIVE (within the EU)
- To prevent other equipment from being interfered with
- To prevent any interference with measurement cables, this could degrade the control performance.

### 1 MOTOR CABLE:

The use of screened cable is very important for an EMC compliant electrical installation. Only screened cables with **copper braid** are suitable; steel reinforced cable is not suitable.

The figure below shows the basic rules of connection of screen to the mounting plate. Ensure that there is a large area of bonding (e.g. by using metal cable clamps).



### 2 WITHIN THE ELECTRICAL ENCLOSURE:

- Use of shielded motor cable (copper braided)
- Large area bonding of screen to the mounting plate on both ends
- The three phases of the motor cable are to be guided through the ferrite toroid between screen earthing and the **FrigoPack** power terminals (not the PE wire!)
- The terminals for the connection to the external motor cable should be mounted away from other terminals.
- For EMC reasons the output safety contactor should be mounted as near as possible (i.e. several cm) to the terminals for the screened cable to the compressor motor.
- Other cables should not be run within the "EMC" hot area.
- If other cables have to cross the motor cable, then this should be only at an angle of 90° to the motor cable (to reduce interference coupling)

### 3 OUTSIDE THE ELECTRICAL ENCLOSURE:

- Screened cable must be used between the electrical enclosure and the compressor motor. The protective earth contactor should be part of the motor cable.
- The screen of the compressor motor cable must be connected to the metal housing with large-area bonding (e.g. cable clamp).
- Other installation cables should have at least 0,25 cm spacing to the motor cable. If there are any long parallel runs (>10 m) then the spacing should be increased proportionally.  
Recommendation:  $\text{Spacing} \geq \frac{l/m}{10} m * 0,25m$  (e.g.: 50 m length → 1,25 m spacing )
- The compressor rack system is also to be earthed with the enclosure mounting plate at lowest possible distance with at least 16 mm<sup>2</sup>.

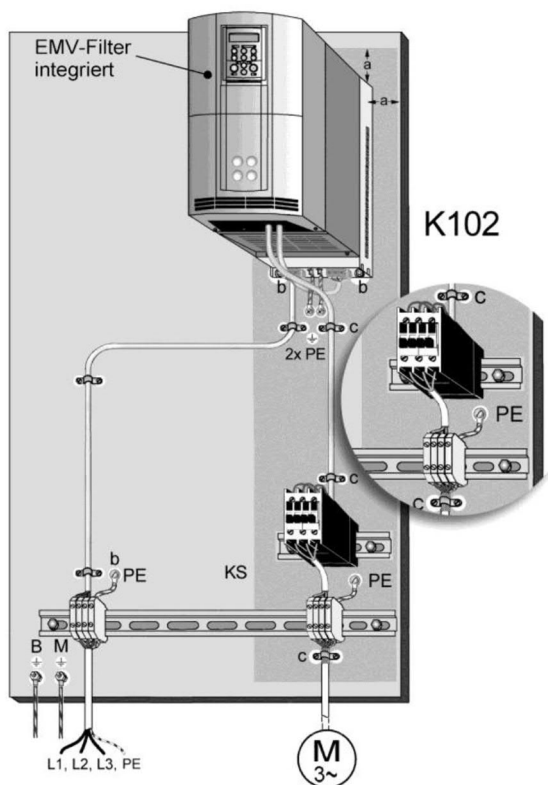
#### 4 SPACING WITHIN THE ELECTRICAL ENCLOSURE

The picture below shows important factors for arrangement and spacing of devices and cables. Please pay special attention to details a) to c).

- a) Minimum spacing of 0,25 m to adjoining equipment, avoid „EMC hot areas“, especially important with field-sensitive equipment and other cables
- b) Contact areas between metallic mounting plate and the **FrigoPack** Refrigeration Inverter, EMC filter, PE earthing bar etc. are to be free of paint or insulation
- c) Cable screen to be clamped to contact area on mounting plate

PE Safety connections:

- PE conductor of supply cable
- B: Cable to building earth
- M: Cable to compressor rack system
- K102: Safety contactor



When using an external EMC filter please pay attention to the following:

- Mount EMC filter as close as possible to the **FrigoPack** Refrigeration Inverter
- Establish short connections between EMC filter and **FrigoPack**

#### 5 PRESSURE TRANSMITTER CABLE

In order to avoid signal interference on the pressure transmitter signal to **FrigoPack** and achieve correct control operation it is important to arrange for the following:

- Install pressure transmitter cable separated from motor cable (for spacing see no. 4. above)
- Use screened cable for lengths >10 m (screen earthing only on **FrigoPack** side, in order to avoid earth loops)