

GUIDE LINES

FOR EMC-CONFORMAL INSTALLATION

PREFACE:

Our products are carefully designed and constructed in order to reduce outgoing and incoming radiation interferences. These guide lines should be carefully observed for a correct installation and to meet the EMC-standards. Incorrect installation may lead to malfunction and to exceed the EMC-limiting-values.

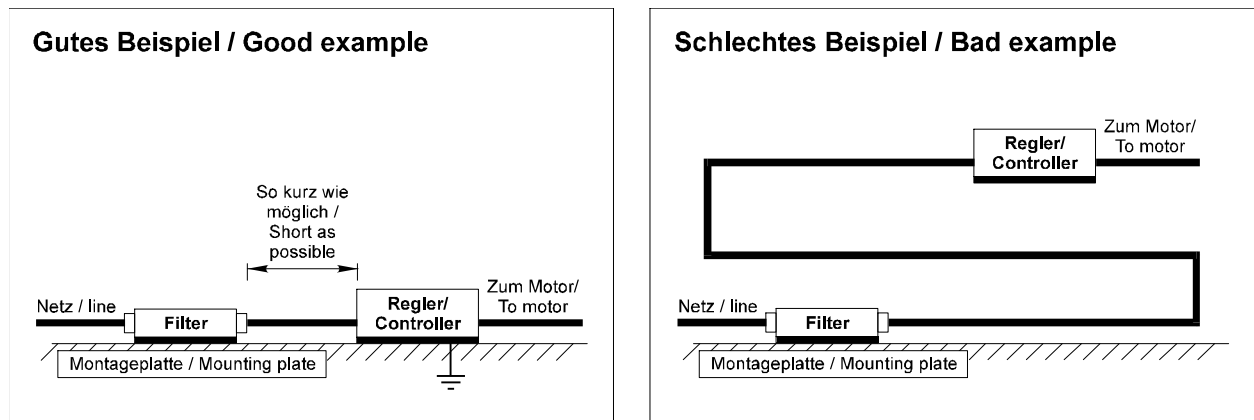
1. INSTALLATION FOR THE CONTROL UNIT

The control unit and the filter are to be installed on a common grounded panel. This panel should preferably consist of a good conductive material and should not be laquered or painted. (refer to picture 3).

2. SUPPLY WIRING

The installation of the supply wiring should provide interconnecting points on a possible large surface. Single stranded conductors with simple clamp connections must be avoided. Preferably are multi stranded conductors with squeeze-on connections. Also line bars with screw-on connections are suitable. The wiring inside of the control box must be kept as short as possible. Short wiring from the supply line to the filter and from the filter to the control unit (see picture 1) reduce feedback interferences into the supply line circuit.

Picture 1

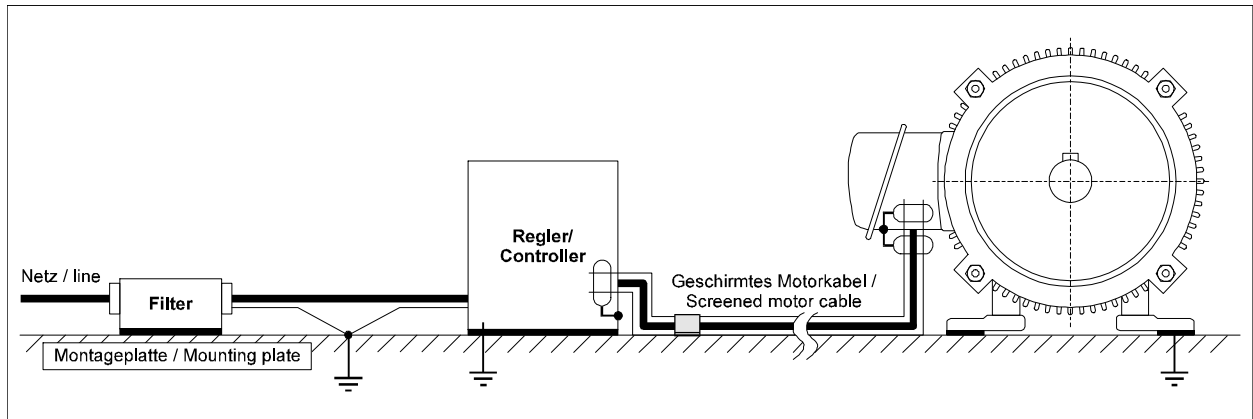


3. MOTOR SUPPLY WIRING

One of the main reasons for radiated and line induced interference is caused by the connection between the control unit and the motor. The connection should be shielded and the wiring should be kept as short as possible (refer to picture 2).

Short spacing between the control unit and motor as well as smaller filters, short shielded wiring and an increased life time of the motor (over voltage due to feed backs) are possible saving potentials. If Thyristor controls are used, two smoothing chokes must be installed in the motor supply line.

Picture 2



4. GROUNDING REQUIREMENTS

All conductive metal enclosures must be interconnected with suitable wiring. The safety requirements with regard to faults at 50Hz require certain minimum wire gauges which must be used for these interconnections.

In case of faults, such as loss of one phase or an extreme unsymmetric three phase system it is possible that the filter can cause creepage currents up to 100 mA. For this reason filters and controls with integrated filters must be grounded before the system is switched on.

In addition to the above mentioned grounding conditions further steps must be observed in order to lead away high frequency currents:

All ground wiring must be kept as short as possible. Poor connections and wire loops act as aerials which could induce radions into the supply line and thus could cause malfunctions.

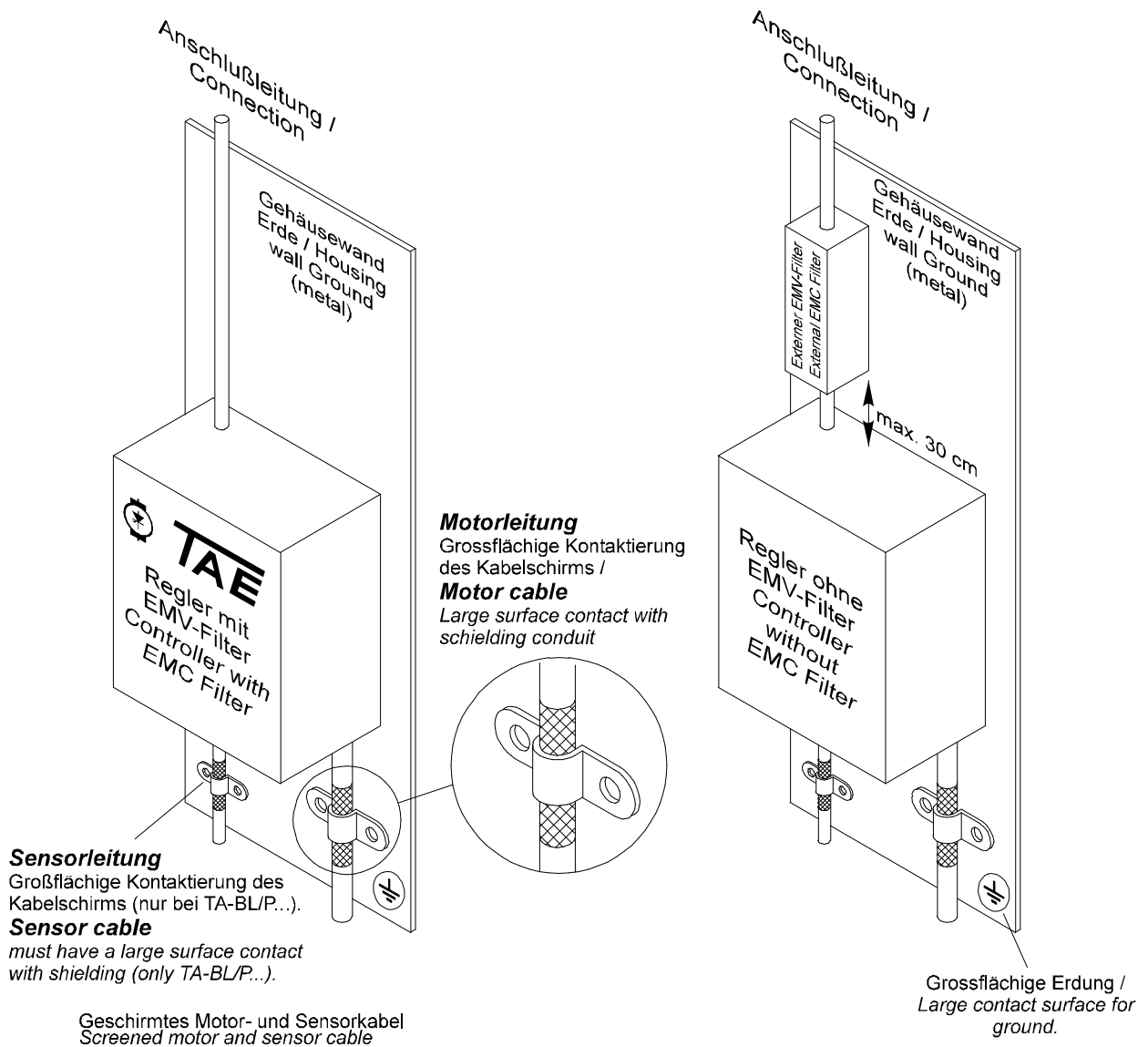
Shielding must cover large areas and provide a radial coverage. Shielding should not be extended by means of wiring. Shielding must also reach into the terminal box or the enclosure of the connected operating unit. The connection of the shield on the motor side could be directly at the PG-bolts. In this case the shield is wrapped over the bolts and then fastened with a clamp. On the control unit the shield is help with a metal clamp and pressed with a large contact surface against the conductive housing. (refer to picture 2 and 3).

5. LAYOUT PLAN

5.1. SUPPLY WIRING AND MOTOR WIRING

It is very important that the line supply wiring is installed separate from the motor supply wiring. Line supply wiring and motor supply wiring should never be installed next to each other or run in one and the same conduit. (refer to picture 3).

Picture 3



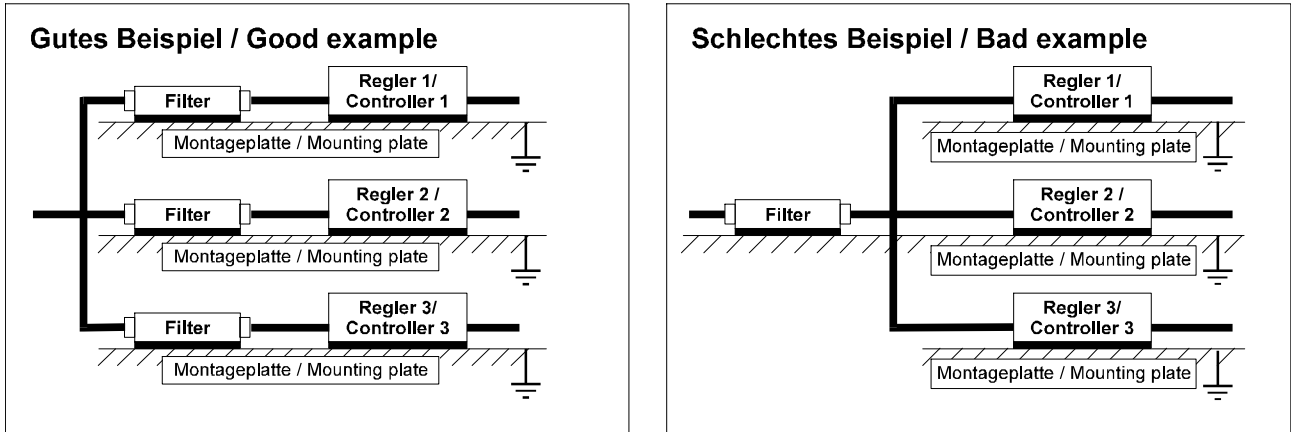
5.2. MOTOR SUPPLY AND CONTROL WIRING

Control wiring for the motor, such as feedback wiring is very sensitive for interferences. This wiring should not run parallel with the motor supply wiring. If this for some reasons cannot be avoided a minimum spacing of 20 cm between these wirings must be maintained in order to obtain a reasonable damping.

6. SEVERAL CONTROL UNITS

If several control units are used it is necessary to use separate filters for each control unit (refer to picture 4).

Picture 4



7. BRAKE CHOPPERS

The connecting wiring between brake chopper/brake resistor and the control unit can cause interferences. This wiring must be shielded and should be kept as short as possible. Correct and careful grounding is necessary (refer to point 4).

8. OUR CONTROL UNITS AND EMC-CONFORMITY

Our measurements are based on the standard EN 50081-2 of the EMC-law. The limit values are specified in standard 55011. The limit values of standard EN 55011 Kl.A. is applicable for industrial purposes. The picture 5 and 6 show diagrams of the interference levels of our units TA-BL 20 IGBT and TA-05 SB/32 both with filters.

These measuring results are also applicable for our other units from the same product line.

The results of these measurements show that our products meet the requirements of standard EN 55011 Kl.A.

The results of our measurements of the immunity against interference have also proven that our products fully comply with the standard EN 50082-2.

9. REFERENCES

These guide lines for installation have been compiled with regard to the following standards:

DIN EN 50178 (VDE 0160-1994-11)

Electronic equipment to be used in electrical power installations

DIN VDE 0100

Erection of power installations with nominal voltage up to 1000 V

DIN VDE 0110

Dimensioning of clearances and creepage distances

DIN EN 50081 Part 2 (VDE 0839 Part 81-2:1994-03)

Electromagnetic compatibility General introduction for electromagnetic compatibility for industrial process measurement and control equipment.

DIN EN 50082 Part 2 (VDE 0839 Part 82-2:1994-11)

Electromagnetic compatibility Immunity against conducted disturbances and fields.