

STEPS TO GET A SUPPRESSION AND IMMUNITY OF 3-PHASE MACHINES

1. Input and Output connection cables to the filter must be separated, and the line cable should get in the shortest way to our suppression parts (after the head switch and fuse). No parallel to other cables, or the input to the filter must be shielded!

2. The suppression parts must be grounded as short and wide as possible and there must be the main earth point.

3. The current and voltage ratings must meet with the ratings of the suppression parts also the fuse.

4. If your machine is connected by a plug, you also must watch the current to the earth and in some cases you must change the FI-Circuit Breaker in one for a bigger current. If you cannot do it, so you must order a filter with low earth current, but with the same parts inside it works not so good. Sometimes your customer or the machine law may give you the maximum of the earth current, or you measure this current you must add minimum 10% and then it must be under the limit.

5. If the machine does not have a MP (Neutral), then the suppression parts without the Neutral can be used, as they are lower in price. 6. You must make sure that there is not more than one earth connection in the machine and its peripherals. For example for motors, computers, and in every case they have an earth, that must be connected at the main earth of your machine. If you are not sure about an existence of a strange earth contact, you have to disconnect your machine from the line and the earth connection. Then you can use an ohmmeter (or a buzzer) between the earth contact of your area and the earth connection of your machine. If you read a low resistance value less than 1 K Ω (or the buzzer beeps), then you have a ground loop. It is the most general mistake that causes malfunction of machines and their electronics. So you must find this strange earth contact by disconnecting each part of your machine peripherals step by step until your ohmmeter reads: "no connection" or buzzer stops its beep.

After this step is achieved, you must disconnect these strange earth connections, and connect the earth of these peripherals to your main earth contact.

7. If you have inside the machine, after the filter, again parts such as contactors and pulse generators which make noises and/or pulses, the filter cannot eliminate them. Therefore, you must put the filter at the input of the sensitive electronic parts, or you must make suppression for these contactors or other pulse generators. You can also make shielded wiring for these noisy parts and connect them before the input connection path of the filter. Or after the filter, all cables are shielded, and there shouldn't be any contactor or pulse generator inside. It is the low-noise region!

The best way to solve EMC Problems is to make the electronic (or sensitive part) sure against noises from the outside, then at the outside you can do what you want also by the wiring.

It makes no sense to put a filter in a cable channel or cable tree because the coupling between input and output make the suppression ineffective.

8. Please don't think about other machines in the near of your machine because every machine has every time a noise fog around it, may be given by a fluorescent lamp switch, from a lightning-flash (by weather) or other events. Every time you must think, your machine must be sure against noises from the outside, and the emissions of your machine must be under the level which the EMC Law requires.

9. All incoming and outgoing except the line input cables of your machine, such as sensors, position givers, motors, etc... works like an antenna and you must make them very slow for example with condensers to the earth, or you must shield them and the shield must be connected to machine's earth as short as possible (at the metal case). If these cables get a noise from the outside, the filter cannot eliminate them because the filter is in the line input.

10. Never use a radio, for checking the noise level, because it has an automatic gain regulation and so you hear the noise in the same loudness, it may be very low or high.

After you perform all the general rules we mention, if your machine has still problems about the noise or immunity, then you must do the following steps:

STEP 1. Try the suppression at first with our CRV (Condenser/Resistor/Varistor) combination, because it has the lowest price and no current limitation by line. For the current to earth see No.4.

STEP 2. If it does not cover the rules, then you can try our filter type: CLC

(Condenser / compensated-choke / condenser combination)

STEP 3. If it again does not fill the law of EMC, then you must use our filter type: CLLC

(Condenser / compensated-choke / 3 or 4 single choke / condenser combination)

At least if it now not fills the law, or it makes also some mistakes, then you have a hole in the system in this way that the noise must not go through the filter (may be outside coupling or by-pass).

If you cannot solve the problem, please call us and we will come or help you by phone if you have already filled these 10 rules. If the machine fills these 10 rules and the EMC-Limits without any suppression parts, you can tell it to us and please thank us[®]. If you need a CE Sign on the machine, then you must send the machine to our laboratory for EMC measurements. With our protocols, you can make a self-declaration for CE about the EMC measurements. You need also a declaration for the machine law and low voltage directive, and if you cannot make it by yourself, you must use the help of people which give you a declaration about the machine law, and the low voltage directive (LVD). For these tests, the filter must be eliminated because the varistors, discharge resistors, and condensers seem like a short for the high voltage tests of LVD. If you have that all, you can put the CE sign on your machine. If you put the CE sign on your machine and it fills not the law of EMC, the machine law, and low voltage directive, and you have no protocols and declarations of them, the penalty will be above 50,000 EURO in Europe, later also in Turkey. In Europe now, the importer must pay this penalty.

Note: If you want to get more knowledge about EMC, then please ask for our seminar pages.

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