

VDE INTERFERENCE REGULATIONS OF WEST GERMANY

Manufacturers of electronic or electrical products that export to other countries should be aware of the legal and technical regulations of the importing country. In some countries rigid laws are established to ensure control of radio frequency interference. For most European countries the interference control regulations will eventually be unified and will be based upon a European Economic Community Directive that is being developed. All EEC countries are expected to ratify the interference directives during 1977/78. The directives are based upon the International Electrotechnical Commission, Special Committee on Radio Interference (IEC/CISPR) Recommendations and Publications [1]. Since West Germany's interference regulations are harmonized with IEC/CISPR recommendations it is expected that most countries in Europe will follow West Germany's approach to interference control.

German Interference Control Laws

In West Germany, the interference control laws have been written and the technical and administrative organizations have been established to enforce the limits. The International Telecommunication Union Treaty of 1947 is the foundation of the "Law for the Operation of High Frequency Apparatus, dated 9 August 1949" [2]. The law assigns the responsibility of interference control to the Minister fuer das Post und Fernmeldewesen (DP-FTZ) (FTZ, Referat C-24, Am Kavalleriesand, D-6100 Darmstadt, West Germany) enforces the administrative regulation [3] which stipulates that if equipment meets a specified interference limit (i.e. VDE 0875) a "General Permit" is issued. The proof of compliance with the limits is the "Radio Protection Emblem" issued by the VDE Testing Station that must be affixed to the equipment.

VDE Organizations

The VDE consists of three distinct organizations that work together to advance electro-technology. Verband Deutscher Elektrotechniker (VDE) is the Association of German Electrical Engineers which consists of dues paying members. As part of this voluntary effort the VDE Regulations are prepared by VDE Standards Committees (VDE Normen Ausschuss). Individual regulations are written for personnel safety, consumer protection, reliability, and to harmonize German and international standards. Each new regulation has a well publicized review that is coordinated with the German Standards Institute (Deutsches Institute fuer Normen, DIN), and the German Electrotechnical Commission (Deutsche Elektrotechnische Kommission, DEK). New VDE regulations also receive a DIN number that is based on the last three digits of the VDE number, i.e. VDE 0874/10.73 becomes DIN 57 874.

The second organization is the VDE Publishing House (VDE Verlag) with offices in Berlin (1 Berlin 12, Bismarkstrasse 33) and Offenbach (D-6050 Offenbach, Merianstrasse 29). The VDE regulations and draft regulations may be ordered from either office.

The third organization is the VDE Testing Station (VDE Pruefstelle) at D-6050 Offenbach, Merianstrasse 28. The VDE Testing Station has been in existence since 1920 [4] originally in Berlin. It was founded to determine the compliance of electrical equipment with VDE safety regulations. The first products tested were fuses and switches up to 60 amperes, trouble lights, and plugs. After the Second World War it was moved to Frankfurt-Main, and in 1968 to its present location in Offenbach.

VDE Testing Station

The VDE Testing Station is a quasi-independent institution of the Association of German Electrical Engineers (VDE). Management of the VDE Testing Station is controlled by the Board of the Testing Station of the VDE which is a standing committee that determines the work areas and fee structure and that draws its members from firms who have an interest in the work of the testing station. The Director of the VDE Testing Station is responsible for the management of the testing station and for the proper performance of the tests. The Director makes the decision to grant, reject or withdraw the permission to use a VDE Emblem. All of the decisions of the testing station may be contested by filing a complaint with the VDE Board. The work areas and fees of the testing station are determined by the VDE Board. The work of the testing station is chartered to be for the common good and extends over the following areas:

1. Safety tests for the VDE Emblem
2. Radio Frequency Interference Suppression Tests
3. Qualification Tests for Electronic Components
4. General Investigations
5. Administration of the VDE Testing Station

The electrical safety is the classical work area of the VDE testing station which caused the foundation of the testing station. These tests extend over products which are used by the general public. The specific items to be tested are tabulated in VDE 0024/11.64, "The VDE Testing Station and VDE Testing Seal" [5]. Principally, it covers electrical installation materials, household appliances, light fixtures, power tools, toys, cables, and wires.

The measurement of radio frequency interference originating from electrical appliances and the effectiveness of interference suppression measures was the second work area that was undertaken by the testing station in 1951. Contractual agreements between the German Postal Service and the VDE are the basis for the RFI measurements by the VDE. The VDE issues certificates of compliance for (1) equipment that generates RF energy intentionally (VDE 0871) and (2) radio and television receivers (VDE 0872.) The German Postal Service then issues a test number that must be affixed to the equipment. For equipment that generates interference as a by-product (VDE 0875) the VDE issues a permit to use the "Radio Protection Mark" that must be affixed to the equipment.

VDE Interference Limits

For equipment that does not intentionally generate RF signals, VDE 0875/7.71 is still valid in 1977. A draft revision (VDE 0875a/. . .74) aligns the "N" limits with CISPR Publication 14 limits. Figure 1 shows the G, N and K limits of VDE 0875a. The difference between these limits and the VDE 0875/7.71 limits are:

- (1) The G, and N interference voltage limits were 3.5 dB higher from 0.15 to 0.5 MHz.
- (2) The G, N and K interference power limits were approximately 10 dB higher at 30 MHz and 5 dB higher at 300 MHz. The use of the clamp-on power probe was made mandatory for all equipments with a power cord. For battery-operated equipment the field intensity limits must be used. The "N" limit is 40 dB uv/meter measured at 10 meters.
- (3) The "N" (normal) limit is universally applicable, The "G" (grob or coarse) limit is applicable for industrial areas, The "K" (klein or small) limit is applicable for remote areas or radio receiver installations.

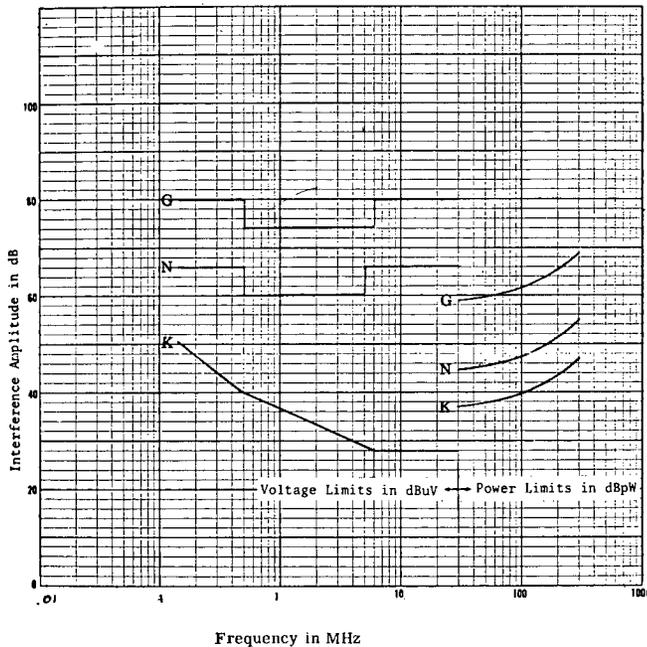


Figure 1. VDE 0875a/...74 Powerline Conducted Interference Limits

Most equipments should meet the requirements of the "B" limits shown in Figure 2. The powerline conducted limit extends to 10 kHz and the radiated interference limit is from 10 kHz to 18 GHz. It is interesting to note that the limits were derived from a special law for the interference control of general purpose data processing equipment, such as mini-computers and table top calculators that generate or utilize RF signals in the 10 kHz to 3 GHz frequency range [6]. This law granted a general permit to equipment that would comply with the following limits:

Powerline Limit: 10 kHz to 150 kHz: 12 dB below the VDE 0875/8.66 limit extended down to 10 kHz with the same slope. 150 kHz to 30 MHz: 12 dB below the VDE 0875/8.66 limit.

Radiated Limit: 10 kHz to 30 MHz: 50 uv/m at a distance of 30 meters from the equipment. 30 MHz and above: 30 uv/m at a distance of 10 meters from the equipment.

Figure 2 shows that the new VDE 0871 powerline limit is 12 dB below VDE 0871/7.71 and the extrapolated VDE 0875/8.66 limit. The VDE interference regulations are:

VDE 0871/...75	Regulation for Equipment that Generates RF
VDE 0872/7.72	Regulation for Radio and TV Receivers
VDE 0874/10.73	VDE Guidelines for Interference Suppression
VDE 0875a/...74	Regulation for Household Appliances (Unintentional RF)
VDE 0876/...75	Regulation for Radio Interference Meters (New Draft)
VDE 0877 Part 1/12.59	Procedure for Measurement of Interference Voltages
VDE 0877 Part 2/12.55	Procedure for Measurement of Interference Field Strength
VDE 0879 Part 1/...75	Regulation for Interference Suppression of Vehicle Equipment and Internal Combustion Engines, Far-Field Suppression (New Draft)
VDE 0565	VDE Regulation for Radio Interference Suppression Networks (New Drafts)
VDE 0565 Part 1/...75	Suppression Capacitors
VDE 0565 Part 2/...75	Suppression Chokes
VDE 0565 Part 3/...75	Suppression Filters to 16 Amp.

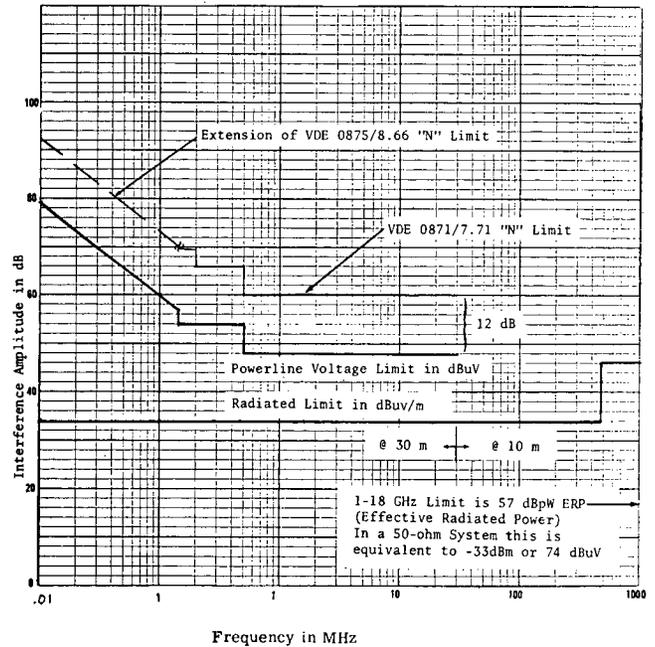


Figure 2. VDE 0871/...75 Interference Limits for Category "B" Equipment (General Permit)

For equipment that intentionally generates RF signals, VDE 0871/3.68 is still valid in 1977. The new draft revision VDE 0871/...75 establishes three limit categories

Limit Category A For equipment that complies with this limit a type approval and a permit must be obtained. (Voltage limit is 12 dB above "B" limit).

Limit Category B For equipment that complies with this limit the "general permit" provision of the German Law is applicable.

Limit Category C For equipment that complies with this limit when measured after installation in an industrial area a special permit must be obtained. (Voltage limit is 12 dB above "B" limit).

REFERENCES

- [1] Mertel, H. K., National and International Radio Frequency Interference Regulations, Don White Consultants, Inc. Publishing Division, Germantown, Maryland, 20767.
- [2] Warner, Alfred, Explanations for the Interference Suppression Regulations for High Frequency Apparatus and Installations, (in German) VDE Booklet 20, 101 p., VDE Publishing House, Berlin, 1970.
- [3] Amtsblatt des Bundesministers fuer das Post and Fernmeldewesen, Ausgabe A, No. 63, Bonn, 10 May 1973, p. 831, Statute No. 319 Interference Suppression of Electrical Apparatus, Machines, and Installations (in German).
- [4] Walther, H., The VDE Testing Station (in German), VDE Booklet 22, 53 p., VDE Publishing House, Berlin, 1970.
- [5] VDE 0024/11.64, The VDE Testing Station and VDE Testing Seal, (in German), VDE Publishing House, Berlin, 1970.
- [6] Amtsblatt des Bundesministers fuer das Post und Fernmeldewesen, No. 97, Bonn, 24 July 1970, p. 1062. Statute No. 529/1970, General Permit based upon the Law for the Operation of High Frequency Equipment. (The "Minus 12 dB Law").

The above material was written by Herbert K. Mertel of EMACO EMC Consultants, Technical Export/Import Consulting Division, San Diego, California