

The Vickers Guide to European Directives



*Machinery Directive
EMC Directive
Low Voltage Directive*

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Foreword

This document has been compiled to give our customers and sales force a practical help in finding their way through the very complex issue of European legislation. It gives the reader a view on Vickers commitment to the European Union and its legislation. The positions taken in interpreting the individual Directives are to the best of Vickers knowledge at the time of publication. As many of the Directives and their interpretations are relatively new, changes may take place which can effect the contents of this document.

Vickers position presented here is backed by extensive discussions with independent advisory councils and industry associations, such as BFPA, VDMA, ZVdE1 and VDE. Vickers reserves the right to change its position and interpretation without prior warning. This document is only intended for use as a general reference and has no legal obligation.

We hope that you will find the guide useful in understanding the Directives and their impact on Fluid Power products supplied by Vickers, Inc. We would like to thank many colleagues and friends in the industry and its associations for their help and inputs to this document.

John Redfern
Vice President and General Manager
Manager
Vickers Industrial Group

Andrew Martin
European Engineering

European Directives



What is a Directive

Intent of the Directives

The aim of the European Union (EU) is to create a genuine single market in which it is as easy to trade between individual member countries as it is within each country. The Treaty of Rome (1957) contains the intention to achieve the free trade, equal to free and unrestricted travel and transfer of financial assets, by creating common and harmonized standards. These standards relate to both product and safety issues.

Until the introduction of common standards, free movement of goods had been impeded by technical barriers. It is the intention of the Directive to replace all National Standards by harmonized ones on a European basis to simplify trade and make products become freely marketable.

Implementation

To overcome the existing trade barriers, the EU adopted a new approach in creating harmonized standards. This new approach allows the publication of a Council Directive which in itself has no technical content but contains the requirement that all products must conform to any application harmonized European EN Standard. Following this, a number of so-called 'New Approach' Directive have been created and are currently being introduced in the EU. These Directives set out essential requirements for health, safety, consumer protection and environment. In general, these are supported by harmonized standards, which have a more technical content compared to the Directives. The Directives have to be adopted by every member state in the EU as a national law which reflects the intent of the Directive itself and becomes enforceable by the national legislative bodies. Due to this procedure, the final interpretation of a Directive cannot be made by any technical committee or association; this is down to supreme courts in each country or the European Court in Den Haag.

Harmonized Standards

There are four types of standard that need to be considered.

- a) Basic standards can describe test conditions, how to perform tests and how to measure the results.
- b) Generic Standards apply to large groups of products and will specify levels to which products need to be tested.
- c) Product Family Standards cover a particular group of similar products. If and where they exist, they take priority over the generic standard.
- d) Product Specific Standards cover particular products or functions. These have the highest priority.

Often there is some confusion around the position of the standards. It must be noted that none of these standards represent the law – they are only supporting documents to the Directives.

EFTA

Application

The Directives apply to all relevant products, independent of country origin and of whether they are trading between EU countries or not. Some products can fall under the scope of several Directives simultaneously. They are applicable whenever a product is brought to the market in any EU country, covering both the supply and the use of the product. In addition to the EU countries, all EFTA states with the exception of Switzerland have also adopted the European legislation.



Compliance to the Directives, CE Mark

Once a Directive has been adopted by national law, it becomes compulsory for that country. Generally, compliance with the Directive(s) is documented by affixing a permanent mark to the product, the so-called CE mark. This is backed up by a Declaration of Conformity, which may or may not be shipped with the product to the end user, depending on the specific Directive. In some cases, compliance is certified with a Declaration of Conformity but NO CE mark is affixed. Please refer to the paragraphs on the individual Directives for further details.

If a product does not comply, the manufacturer or his representative **MUST** clearly state that the product is not suited to obtain certification. In these cases, it is possible that a member country can demand that the product is removed from the market. However, the manufacturer must be given a reasonable time to ensure compliance prior to this taking effect.

Scope of Vickers Guide

This guide is applicable to all fluid power products from Vickers, Inc. independent of their manufacturing location. It covers components as well as systems, such as power units, test benches, etc. Also included are the associated electrical and electronic products used in conjunction with fluid power products, however electric motors are not included in this guide. Please contact your motor supplier for further information, especially with regards to the EMC Directive.

Implications of the Directives

Machinery Directive

Legislation

The Machinery Directive 89/392/EEC became effective January 1, 1993, with a two year transitional period during which manufacturers were given time to adjust their products to the new requirements. As of January 1, 1995, the Machinery Directive is part of any EU member countries national legislation and is therefor enforceable. In terms of its coverage, it is probably the most wide-spread of all of the Directives. Basically any 'machine' falls under its scope, unless more stringent and specific standards and/or Directives have been published.

Definitions

For the purpose of the Machinery Directive, a machine is defined as: 'an assembly of linked parts or components, at least one of which moves, with the appropriate actuators, control and power circuits, joined together for a specific application, in particular for the processing, treatment, moving or packaging of a material'.

CE Mark, Technical File

Compliance with the Directive is identified by applying a CE Mark to the 'machine', normally done by the manufacturer as self-certification. Besides assuring conformity to any applicable standards, the manufacturer is also obliged to compile a 'Technical File' which he has to present on request to anybody who has a justified cause to query the conformity of the 'machine'. A minimum content, this must include part number (model code), manufacturer's address, assembly and installation drawings and a commissioning guideline.

Application to Fluid Power Products

By this definition, certain fluid power products could be classified as a 'machine' e.g. robotics or handling equipment. However, in normal circumstances the fluid power components or systems cannot perform any function in the sense of the Machinery Directive without being fully installed into the 'machine'. Therefore the requirement for certification and CE MARK does not apply!

Manufacturers Declaration

Due to the applicability of the Machinery Directive to Fluid Power, the responsibility for certification and CE marking lies with the manufacturer of the 'machine' as in the sense of the Directive. However, to be able to create the Technical File it is a requirement that all components being used to assemble the 'machine' must be supported by a 'Manufactures Declaration', which certifies that the component is suited for assembly into a 'machine' in the sense of the Directive.

NOTE: In this context, power units and manifold assemblies, each consisting of several fluid power components, may be treated like an individual component, i.e. they only require a 'Manufactuere's Declaration'. The responsibility for providing this document is down to the designer / manufacturer of the unit and/or manifold.

References, Standards

89/392/EEC European Union Machinery Directive

pr EN 683 Hydraulic Presses – *Safety*

EN 982 Safety of Machinery – *Safety requirements for fluid power systems and their components – Hydraulics*

EN 983 Safety of Machinery – *Safety requirements for fluid power systems and their components – Pneumatics*

EN 29000 Quality Assurance

EMC Directive

Legislation

The Council Directive relating to Electromagnetic Compatibility is 89/336/EEC, dated 3rd May 1989. This Directive, which has become known as the EMC Directive, was amended on 28th April 1992 by Directive 92/31/EEC to include the revised CE marking requirements. Products, to which the EMC Directive applies, must conform if they have been taken into service after 28th October 1992. However, as with the Machinery Directive, the Council allowed for a transitional period until 31st December 1995. Therefore, effective January 1, 1996, the EMC Directive applies to all products which fall under its scope, except for field replacement and spare parts.

Definitions

The EMC Directive applies to all products which, by themselves, can perform a direct function in the sense of the Directive.

Direct function: Product performs a function solely by applying the supply voltage and a command signal, analogue **or** digital.

It must be clearly noted that the definition of a 'function' here is **FUNDAMENTALLY** different to the definition in the Machinery Directive. (See page 10).

Application to Fluid Power Products

Fluid Power products can contain electrical and electronic components. Whether they fall under the scope of the EMC Directive is to be determined by the manufacturer. The first question to be answered is whether the product is intended to be put on the market for a general purpose.

Generally, fluid power products are designed and manufactured for a restricted market and used by professional clientele. However, it cannot be excluded that the products become available to the general marketplace; therefore the products need to be treated as intended to be placed on the market for general distribution and/or use.

Application to Fluid Power Products (Cont'd)

Exceptions are products which by nature of the contractual arrangements are being provided to only one customer for the sole purpose of being included into a specific product with known function. In this case, the fluid power product need not be certified and CE marked and need not conform to the EMC Directive by themselves. However, the product into which they are incorporated **MUST** comply to the protection levels specified in the relevant harmonized standards.

For generally available products, the next question is whether the products perform a direct function in the sense of the Directive or not. If it is declared not to have a direct function, then the product does **NOT** fall under the scope of the EMC Directive and need not be certified and/or designated such that protection levels can be met. Examples for this type of products are solenoid operated switching valves (both AC and DC).

If the fluid power product can perform a function in the sense of the directive, then compliance to the standards, especially EN 50081–2 and EN 50082–2, is compulsory and a CE mark must be affixed to either the product or the accompanying documentation.

If the product is categorized not to perform a function but does not contain a potential EMC problem, either in form of susceptibility to electro–magnetic interference or generation thereof, then measures must be taken to ensure that compliance to the protection levels specified in the harmonized standards can be maintained. This can be done either by measures on the fluid power product itself or by measures in the final installation. In the case of the product providing suitable protection by itself, a CE mark may be affixed.

Compliance, CE Mark

Unlike the Machinery Directive, the EMC Directive does not distinguish between Declaration of Conformity and Manufactures Declaration. Either a product falls under the scope (see above) and conforms, or it does not. In the case of conformance, the CE mark can be affixed by self–certification. However, the manufacturer must be able to prove conformance with the standards if a justified cause is given. Whether this is the case or not has to be decided by the national body assigned by the government with the responsibility for enforcing the EMC Directive in every country. As a result of this, there is not justified legal requirement for certification by an authorized test facility.

The Declaration of Conformity need not be issued with the product (unlike in the case of the Machinery Directive) and resides with the manufacturer of the product. On request, copies will be provided to the customer / end user. Legislation does **NOT** require this to be done automatically.

Vickers Position on the EMC Directive

Vickers globally supports the position outlined above. In order to help our customers products comply with the harmonized standards, we have introduced EMC certified versions of most of our products with electrical and electronic components. There are either available as a standard product or as a model coded option. Please contact your local sales representative or designated product specialist for further information. Also refer to GB 2479 shown in this guide.

References, Standards

89/336/EEC European Union Electromagnetic Compatibility Directive

EN 50081 – 2 *Generic Emissions*

EN 50082 – 2 *Generic Susceptibility Guideline on the application of Council Directive 89/336/EEC.*

Publications of the Council of Ministers, November 1995

Low Voltage Directive

Legislation

The Low Voltage Directive was initially published in 1973 as 73/23/EEC, amended in 1993 by 93/68/EEC. The Directive following the 'new approach' came into effect January 1, 1995, with the transitional phase ending on December 31, 1996. As of January 1, 1997, the Low Voltage Directive is mandatory. In essence, it covers the safety of people handling products using voltages in the range of 50 VAC to 1000 VAC or 75 VDC to 1500 VDC. Protection is required with regards to electrical shocks, high surface temperatures and flammability. Products which fall under this scope must comply.

Definitions

The Low Voltage Directive covers **ALL** products using electric voltages between 50 and 1000 VAC and 75 to 1500 VDC.

Application to Fluid Power Products

Fluid Power products fall under the scope of the Directive, although they are not handled by personnel in normal operating models. Due to this restriction, surface temperatures, for example on solenoids, may reach levels which could cause skin damages. No leeway is given with regards to the electrical hazards.

Since the Directive requires a 'redundant' protection against electrical shocks, single insulation is not accepted by itself. Therefore, a second and independent protection must be applied, most commonly in the form of a protective ground. Therefore, all products using voltages in the specified range must have a third lead and/or connector, providing the protection.

Reference, Standards

93/68/EEC European Union Low Voltage Directive

HOW DO I ...

...Obtain Certification for the Machinery Directive?

Components

Components (as individual items) do not require CD marking or Declaration of Conformity. Therefore, the Manufacturer's Declarations (see page 18) Issued by Vickers Systems, is all that is required. In case a Technical Files is requested by the customer, all the information provided in the Vickers catalog is sufficient.

Safety relevant components, if sold under a contractual arrangement specifying them as such, must be certified by the manufacturer and delivered with CE mark and certification, if requested.

Manifolds

Manifolds do not required CD marking or Declaration of Conformity. A Manufactuere's Declaration is sufficient and must be provided by the manufacturing / assembling location. We recommend using the Vickers generic document as a template (see page 13).

To be able to issue the Manufacturer's Dec

- Manifold must carry model no., manufacturer's name and address and must specify maximum pressure.
- Technical file needs to be complied and supplied on request, containing:
 - Assembly drawings
 - Circuit diagrams
 - Cross-reference between connection ports and positions in circuit (can be achieved with circuit diagram and assembly drawings)
 - Commissioning instructions, if any required

Vickers Generic Document

**MANUFACTURER'S DECLARATION
(MACHINERY DIRECTIVE #89/392/EEC)**



Manufacturer's Name: Vickers Systems Div.
Trinova Corporation

Manufacturer's Address: P.O. Box 4
New Lane
Havant
Hampshire, PO9 2NB
England

Declares That:

PRODUCT NAME: HYDRAULIC MANIFOLD PACKAGES

MODEL SERIES:

Complies With:

We declare that products mentioned above conform with ISO4413 and EN982 (draft dated June 1994) standards supporting machinery directive 89/392/EEC (amended 91/368/EEC) when applied to catalog ratings identified by the model code. Additional relevant standards that apply to the products are:

Additional Information:

The components should not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the essential regulations of the directive.

Signed _____

Name _____

Title _____

Date _____

Systems (e.g. Power Units)

The same applies here as for manifolds, Self certification (Manufacturer's Declaration) has to be provided by power unit design location, in conjunction with the manufacturing / assembling location.

... Obtain Certification for the EMC Directive?

Components

For third party products:

Although the EMC Directive does not permit self-certification, Vickers recommends using an authorized test facility to check compliance. For fluid power products, all tests have to be performed to EN 50081-2 and EN 50082-2, with a minimum test level of 10V/m.

For Vickers products:

First, check whether components fall under the scope of EMC Directive (see page 8). Then, check in Annex whether Vickers is supplying a component with integrated protective measures. In these cases, the product will already bear the CE mark or the catalog information will identify compliance with requirements specified by EN 50081-2 and EN 50082-2. This information can be used as a method of certification, whenever the product is categorized to not performing a direct function, but bears a potential susceptibility/emission problem.

For products which perform a direct function, a Declaration of Conformity can be provided on request.

Installation, Systems

Third party products:

If the overall installation or system is classified as performing a direct function in the sense of the Directive, protection levels have to be met by the **TOTAL** machine. Although the EMC Directive does permit self-certification, Vickers recommends using an authorized test facility to check compliance. For fluid power products, all tests have to be performed to EN 50081-2 and EN 50082-2, with a minimum test level of 10V/m.

It is justified to assume that if all components used with the installation or system provide sufficient protection by themselves, then the total product will conform to the generic standards. In these cases, testing by an authorized test facility can be avoided and the CE mark can be affixed with justified cause.

NOTE: In many cases, the conformity can only be achieved if you follow the wiring and installation guidelines exactly. Vickers products can only maintain the levels of protection if these guidelines are followed.

For power units using electric motors, please refer to their manufacturer information.

Vickers Products

Same as for third parts products.

... Obtain Certification for the Low Voltage Directive?

Components

If the components fall under the scope of the Directive, they will bear the CE mark as from the end of the transitional period. Declaration of Conformity will not be automatically provided with the product.

Installation, Systems

As long as suitable products are selected (e.g. three lead, protective ground), self certification is permitted.

Annexes

European Union Member Countries

Austria, Belgium, Denmark, Finland, France, Germany, Great Britain, Greece, Italy, Ireland, Luxembourg, Netherlands, Portugal, Spain, Sweden.

European Free Trade Area Member Countries

Cyprus, Iceland, Israel, Malta, Norway, Poland, Slovenia (affiliated to EFTA), Switzerland.

Exceptions When Applying Directives to Fluid Power Products

Machinery Directive: Application to Fluid Power Products

Fluid power products requiring CD mark are components which, in the past, have already been classified as 'safety relevant' and which have been thus specified in contractual agreements between a supplier and the customer. Examples here are gate valves on injection molding machines which have been TÜV certified and position monitored directional valves. However, these only NEED to be certified if they are specifically taken to market as suited to comply with the regulations for safety relevant components, i.e. this is a contractual issue more than a legal one.

EMC Directive: National Implementation

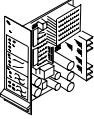
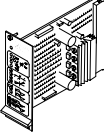
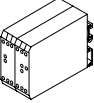
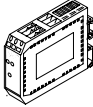
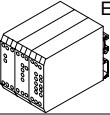
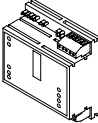
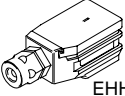
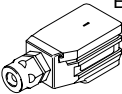
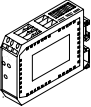
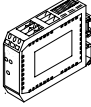
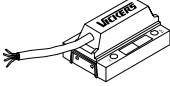
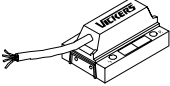
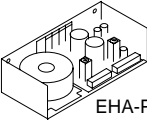
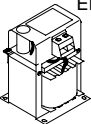
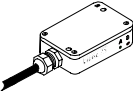
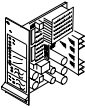

Certain European countries, such as Italy and Greece, had not adopted the EMC Directive into National Law at the time of publication of this guide.



Changes to Electronic Products to Qualify

(European Electromagnetic Compatibility Directive (EMC) 89/336/EEC, amended by 91/263/EEC, 92/31/EEC and 93/68/EEC, article 5)



Existing Product	Changes Made	Changes to Specification	Full CE Approval
 <p>EEA-PAM-5**-A-30 EEA-PAM-5**-B-30 EEA-PAM-5**-C-30 EEA-PAM-5**-D-30 EEA-PAM-5**-E-30 EEA-PAM-5**-F-30</p>	Complete re-design to conform to European Community regulations for electro-magnetic compatibility: EMC	Total pin-out compatible	 <p>EEA-PAM-5**-A-32 EEA-PAM-5**-B-32 EEA-PAM-5**-C-32 EEA-PAM-5**-D-32 EEA-PAM-5**-E-32 EEA-PAM-5**-F-32</p>
 <p>EHA-CON-201-A-10 EHA-RMP-201-A-10</p>	Complete re-design: new housing	New "PSU" version. Voltage control of ramp on "RMP"	 <p>EHA-CON-201-A-20 EHA-RMP-201-A-20 EHA-PSU-201-A-10</p>
 <p>EHA-DSG-201-A-10 EHA-PID-201-A-10</p>	Complete re-design: new housing	"DSG" now digital	 <p>EHD-DSG-201-A-10 EHA-PID-201-A-20</p>
 <p>EHH-AMP-7*2*-10</p>	Complete re-design: same housing	Differential inputs on proportional versions	 <p>EHH-AMP-7*2*-20</p>
 <p>EHA-PAM-291-A-10</p>	Filters added to conform to EC regulations	No change to housing	 <p>EHA-PAM-291-A-20</p>
 <p>EHH-AMP-724*-10</p>	No changes necessary		 <p>EHH-AMP-724*-10</p>
 <p>EHA-PSU-704*-10</p>	Old design replaced by new	3 sizes now available: 3,5A 5,0A 10,0A	 <p>EHA-PSU-704-A****-20</p>
	New product introduced		 <p>EHD-AMP-73*-*-10</p>
 <p>EEA-PAM-5**-*-1*</p>	No changes possible. Available only to customers who accept "Not to CE"		

**The Vickers Manufacturers Declaration
Machinery Directive**

**MANUFACTURER'S DECLARATION
(MACHINERY DIRECTIVE #89/392/EEC)**



Manufacturer's Name: Vickers Systems Div.
Trinova Corporation

Manufacturer's Address: P.O. Box 4
New Lane
Havant
Hampshire, PO9 2NB
England

Declares That:

PRODUCT NAME: HYDRAULIC COMPONENTS

MODEL SERIES:

DG2, DG3, DG4, DG5, DG17, DG18, DG20, DG21, DG22
DGMR, DGMC, DGMX, DGMD, DGMP, DGMFN
R, C, X, ECT, EURT
FRG, F(C)G, (E)FN, FM
DT, DS, C2, C5G, HCT(G), PCG
POC, VCB, RV, CV, DSV, EPRV, MCV, NV, PC, MOS, FR,
PFR, PTS, MRV, SPC, DP
CVU, CVI, CVC(S)
ABT, ABS, AL, ST
M04/06/02/300/400/600, S-600, OFR(S), ML, MT, OF, F, L0
TV, TZ
ECG, EPV, EHST, K(A)CG

KT, KD, KF, KA, KS, KH, ERV, KV
EHD, EEA, EHA, EED, EHH, EPAD, EMA
SM4, SH4
HRC, VLD, CM11, CMB, CMC, CME, CMH, CMX, EMV
CPF, UPF, DCP
V, VI, VQ, VVA, VVB, VPF, VMQ
PVB, PVQ, PVH, PVE, PV, TV, PF(B), PVD
MFB, MFE, MVE, MHT, M, M2, MFD
<P
TA

DIRECTIONAL VALVE
SYSTEMSTAK VALVES
PRESSURE CONTROLS
FLOW CONTROLS
CHECK VALVES
SCREW-IN CARTRIDGE
VALVES
CARTRIDGE VALVES
ACCESSORIES
FILTERS
CYLINDERS
ELECTRO-HYDRAULIC
PRESSURE CONTROLS
PROPORTIONAL VALVES
ELECTRONIC S
SERVO VALVES
MOBILE CONTROL VALVES
FLANGE MOUNTED VALVES
VANE PUMPS
PISTON PUMPS
MOTORS
MOTORPUMP
TRANSMISSIONS

Complies With:

We declare that products mentioned above conform with ISO4413 and EN982 (draft dated June 1994) standards supporting machinery directive 89/392/EEC (amended 91/368/EEC) when applied to catalog ratings identified by the model code. Additional relevant standards that apply to the products are:

Additional Information:

The components should not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the essential regulations of the directive.

Signed _____

Name _____

Title _____

Date _____

Manufacturer's Declaration of Conformity



MANUFACTURER'S DECLARATION OF CONFORMITY

European Community Electromagnetic Compatibility (EMC) Directive
89/336/EEC amended by 91/263/EEC, 92/31/EEC and 93/68/EEC article 5.

Manufacturer's Name: Vickers Systems Div. Trinova Ltd.
Manufacturer's Address: P.O. Box 4
New Lane
Havant
Hampshire, PO9 2NB
England

Declares that the following components conform with the protection requirements of the above mentioned directives when used as defined in the relevant catalog leaflets and installation instructions packed with the product.

MODEL SERIES:

EEA-PAM-5** - A/B/C/D/E/F-32
EHA-CON-201-A-20
EHA-RMP-201-A-20
EHA-PSU-201-A-10
EHA-PAM-291-A-20
EHA-PID-201-A-20
EHD-DSG-201-A-10
EHH-AMP-702-A/C/D/J/K-20
EHH-AMP-712-D/G-20
EHH-AMP-724-A/C/D/Z-10
EHD-AMP-73*-10
KBFD/TG4V-3/5-10
KFD/TG4V-3/5-10
KBSDG4V-3-10
KSDG4V-3-11
KFDG5V-5-30
KFDG5V-7/8-12
CVU** - SWD-10
CVU** - EFP1-31
DG4V-3-S6-60
DG4V-5-S6-20

DESCRIPTION:

Eurocard amplifier
Convertor module
Ramp generator module
Power supply module
Servo amplifier module
PID closed loop module
Demand signal module
Power plug
Power plug
UNIPLUG Connector
Mobile amplifier
Proportional directional valve
Proportional directional valve
Proportional directional valve
Proportional directional valve
Proportional directional valve
Proportional directional valve
Safety cartridge valve
Cartridge throttle valve
Directional valve with switch
Directional valve with switch

APPLICABLE STANDARDS;

EN50081-2 (Emission)
EN50082-2 (Susceptibility)

RELATED DOCUMENTS;

EN 61000-2-4
EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-11

Signed _____

A.D.A. Martin, Engineering Manager

Date 19th November 1996