

The electric control cabinet in the framework of the Machinery Directive

www.maschinenrichtlinie.de

www.maschinenbautage.eu

The electric control cabinet in the framework of the Machinery Directive¹

- | | | |
|---|---|---|
| 1 | Introduction | 2 |
| 2 | The control cabinet – a safety component? | 3 |
| 3 | Exclusions from the Machinery Directive | 4 |
| 4 | Official Statements | 7 |
| 5 | Consequences of placing a control cabinet on the market | 8 |
| 6 | Literature | 9 |

Placing an electric control cabinet on the EC Single Market

Just like any other product, an electric control cabinet is subject to the relevant legal provisions when being placed on the market.

Electric control cabinets with open-loop controls for machinery and plants may have to meet various requirements. Among them may be the Directives on Low-Voltage, EMC, Equipment for Potentially Explosive Atmospheres and the Machine Directive as well. The manufacturer has to find out case by case which Single Market provisions apply.

Moreover, individual checks have to be made to identify the manufacturer of the electric control cabinet in the meaning of the Single Market provisions.

mbt maschinenbautage

Machinery Conference Cologne

The annual German conference on the CE-Requirements concerning plants and machines

Translation on request

Director:
Dipl.-Ing.
Hans-J. Ostermann

Practical solutions for the manufacturer in the Single European Market

CE

MBT Mechtersheimer GbR
Auf dem Senkel 40
53859 Niederkassel
www.maschinenbautage.eu

mbt maschinenbautage mechtersheimer

¹ Original publication: Technische Sicherheit Vol 1 (2011), No. 5, May pp46.

1 Introduction

Electrical control cabinets comprising the control equipment for machinery and plants are among the products on the European Single Market and thus have to fulfil the conformity requirements of every relevant Directive applicable to them. Apart from those Directives familiar to the expert such as the Directives on low-voltage (2006/95/EC), EMC (2004/108/EC) and, if applicable, on equipment for potentially explosive atmospheres (94/9/EG), the scopes of other Directives have to be scrutinized, e.g. the one on ecodesign (2009/125/EC). Even the Machinery Directive 2006/42/EC governing at least the final machinery or plant including the electric control cabinet, has to be checked for application.

This report deals with the relevance of the Machinery Directive for an electric control cabinet and the included control equipment for machinery and plant (called “control cabinet” in the following text).

First of all, the basis of this assignment is Article 1 (1) of the Machinery Directive where the scope of the Directive is defined. Here Article 2 (c) of the Machinery

Directive is particularly important for control cabinets. The definition of the term „safety component“ is set as follows:

Article 2 (c)

„safety component“ means a component,

- which serves to fulfil a safety function,*
- which is independently placed on the market,*
- the failure and/or malfunction of which endangers the safety of persons, and*
- which is not necessary in order for the machinery to function, or for which normal components may be substituted in order for the machinery to function.*

An indicative list of safety components can be found in Annex V which can be updated in accordance with Article 8, paragraph 1 (a).

Attention shall be paid to the fact that the definition of the Machinery Directive valid since 29 Dec., 2009, is more precise than the “old” Directive but not new regarding the content. This means that the control cabinets subject to the “new” Machinery Directive have already been products within the meaning of the “old” Machinery Directive.

However, the Machinery Directive also lists products which are specifically excluded from its scope.

Details can be found in Article 1 (2).

Moreover, Article 3 describes “Specific Directives” with instructions on how to use the Machinery Directive in accordance with other Directives, where individual or all hazards from a product are listed more precisely than in the Machinery Directive. Therefore, these Directives will have to take precedence over the Machinery Directive with regard to these hazards.

The first step to make sure that the Machinery Directive is applicable to an individual control cabinet is to check whether the control cabinet is a safety component as per Machinery Directive. Then – if so – a check has to be made whether it is one of the exclusions defined in the Machinery Directive. Furthermore, a check has to be made whether a specific Directive exists for this safety component so that this Directive has to take precedence wholly or partly over the Machinery Directive.

Last not least, attention has to be paid also to the fact that Directives other than the Machinery Directive may be applicable with instructions on aspects different from those in the Machinery

Directive. The manufacturer always has to observe all relevant legal provisions when placing his product on the market. Prove of this

observation is also given by the CE marking affixed to the products in his own responsibility wherever the

marking is applicable due to these regulations.

2 The control cabinet – a safety component?

A check can be made whether or not a control cabinet is part of the scope of the Machinery Directive by means of the routing diagram for decisions in Figure 1:

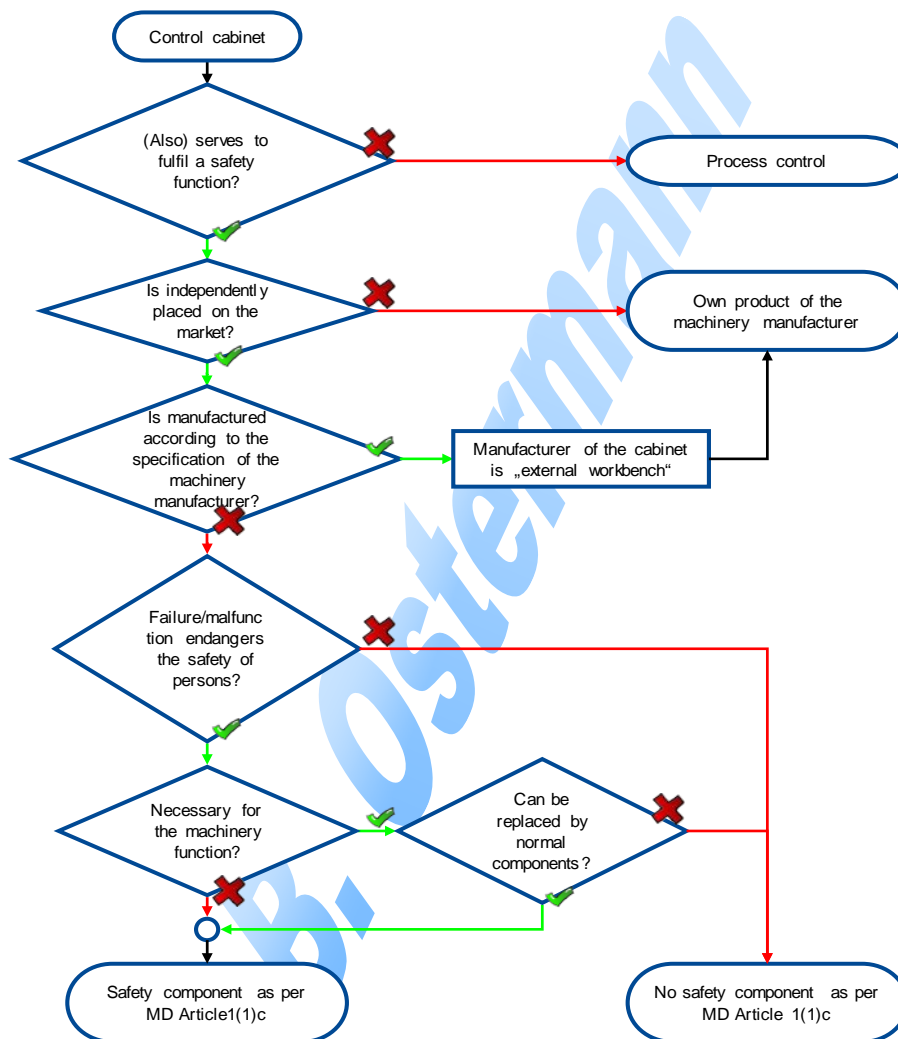


Figure 1: Routing diagram of decisions for application of the Machinery Directive

A control cabinet for a machine/plant without any safety function at all is not a safety component. It comprises nothing but a process control device which in itself is not governed by the Machinery Directive. The

classification of the safety function is made by the manufacturer in the instructions on the intended purpose of the control cabinet.

In this respect, the Guide to the application of the Machinery Directive states:

§ 42 *Safety components*
 [...] purely operational components are not considered as safety components. [...] Components placed independently

on the market that are intended by the component manufacturer for functions that are both safety and operational functions, or that are intended by the component manufacturer to be used either for safety or for operational functions are to be considered as safety components.
[...]

Thus, there is no doubt that products having both safety functions and operational functions fall within the scope of the Directive.

A control cabinet placed on the market by a manufacturer together with a complete or partly completed machine will not individually fall within the Directive as it is not “placed on the market independently”. The control cabinet is then part of the conformity assessment of the entire (partly completed) machine.

The same applies to a control cabinet built in accordance with the exact specification of the machinery manufacturer (e.g. circuit diagram with all relevant data). In this case the manufacturer of the control cabinet is regarded as the “external workbench” of the manufacturer of the machinery. The general responsibility for the conformity of the control cabinet as an element of the

(partly completed) machine lies with the manufacturer of the machinery.

Further details of this aspect can be found in the comments of the so-called „Blue Guide“², an interpretation of the Single Market regulations. Section 3.1.1 regarding manufacturers reads as follows:

“The manufacturer may design and manufacture the product himself. As an alternative, he may have it designed, manufactured, assembled, packed, processed and labelled with a view to placing it on the market under his own name or trademark, thus presenting himself as a manufacturer.”

On condition that the failure or malfunction of the control cabinet will not lead to a potential hazard, the control cabinet is not a safety component as per definition of the Machinery Directive.

Another exclusion from the application of the Directive is any such component which cannot be replaced by normal components although they fulfil safety functions and are placed on the market independently. However, this provision has no

consequences for control equipment.

Any other control cabinet characterized by:

- *at least one safety function,*
- *independently placed on the market,*
- *endangering of persons in case of failure or malfunction,*
and
- *feasible replacement by „unsafe“ control cabinets to ensure functioning of the machinery within the process*

is in principle subject to application of the Directive.

3 Exclusions from the Machinery Directive

If the control cabinet corresponds to the definition of a safety component in the Machinery Directive, a check shall be made whether or not one of the exclusions applies to the individual case.

Article 1 (2) of the Machinery Directive reads as follows with regard to control cabinets:

(2) The following are excluded from the scope of this Directive:

- a) safety components intended to be used as spare parts to replace identical components and supplied by the manufacturer of the original machinery;*

[...]

- k) electrical and electronic products falling within the*

² The 'Blue Guide' on the implementation of EU product rules
2014 (Version 1.1 – 15/07/2015)

following areas, insofar as they are covered by Council Directive 73/23/EEC [...]:

– [...]

– low-voltage switchgear and control gear,

– [...]

l) the following types of high-voltage electrical equipment:

– switchgear and control gear,

– [...]

Note regarding k):

Meanwhile, Directive 73/23/EEC (Low-Voltage Directive) has been replaced by a consolidated new version, Directive 2006/95/EC³. According to Article 1 (2) a) of the Machinery Directive, safety components are excluded from its scope if they are supplied as spare parts for identical products from the manufacturer of the machinery. Therefore, “a safe control cabinet” of machinery that is sold by the manufacturer of this machinery as a spare part, is not governed by the Directive. However, this exclusion does not apply to the supply of these products by the manufacturer of the control cabinet to the manufacturer of the machinery or even to the

buyer of the machinery. It only applies to the supply by the manufacturer of the original machinery. The exceptional case that a safety control cabinet need not be assessed as a safety component will arise only if the manufacturer of the machinery himself produces the spare control cabinet or has it produced by an “external workbench”.

This is also true for control cabinets other than the original ones provided that the safety function is identical. Reference is made to § 48 of the Guide to the application of the Machinery Directive:

§ 48

[...]

This exemption also applies in cases where identical components are no longer available and the machinery manufacturer supplies spare parts with the same safety function and with the same safety performance as the components that were originally fitted to the machinery.

The exclusions of the above-mentioned paragraphs k) and l) do not apply. The Guide to the application of the Machinery Directive clarifies the fact that the exclusion as per Article 1 (2) k) of the Machinery Directive relating to low-voltage

switchgears cannot be adopted to electrical switchgears that are safety components in the sense of the Machinery Directive. The same is also true for electrical high-voltage equipment even if it is not explicitly mentioned in the EC Guide:

§ 42 Safety components

[...]

The exclusion of low-voltage switchgear and control gear set out in the fifth indent of Article 1 (2) k) does not apply to electrical safety components [...] and

§ 68 Low-voltage switchgear and control gear

[...]

It should also be noted that this exclusion does not apply to low voltage electrical safety components [...]

As a consequence of § 42 and § 68 of the Guide to the application of the Machinery Directive, safety switchgears do not count among the exclusions regarding switchgears and control gears. That is why they cannot be excluded from the scope of the Machinery Directive by Article 1 (2) k) or l) either.

Another “exception” is described in Article 3 of the Machinery Directive:

³ From 20th April, 2016, onwards: 2014/35/EC

Specific Directives

Where, for machinery, the hazards referred to in Annex I are wholly or partly covered more specifically by other Community Directives, this Directive shall not apply, or shall cease to apply, to that machinery in respect of such hazards from the date of implementation of those other Directives.

This exclusion will lead to a complete exception of the control cabinets dealt with in this report only on condition that the other specific Directive adopts the safety objectives set out in Annex I of the Machinery Directive and outlines them in more detail. This is the case in e.g. the Directive on medical devices (2007/47/EC).

As far as explosion hazards are concerned, Directive 94/9/EC⁴ on equipment for potentially explosive atmospheres has to be applied together with the Machinery Directive, however does not substitute it as a whole.

According to Annex I No. 1.5.1, the safety objectives of the Low-Voltage Directive (2006/95/EC⁵) for electrical hazards have to be observed, but not the overall objectives.

Therefore, the Low-Voltage Directive (2006/95/EC⁵) plays a special role. The clear distinction between Machinery Directive and Low-Voltage Directive entrains application of the Machinery Directive for safety control cabinets, not of the Low-Voltage Directive.

The EMC Directive (2004/108/EU⁶) has a parallel rank as compared with the Machinery Directive because it does not cover hazards in the sense of the Machinery Directive. However, the importance of the CE marking has to be considered (see above).

The Directive on ecodesign (2009/125/EU) concentrates on the relevant environmental aspects of a product. The Commission of the EC established implementation measures for individual groups of products. At present, there are no measures for complete control cabinets, but they exist for purchased parts such as screens and fans.⁷

Figure 2 shows the routing diagram of decisions for the determination of whether a control cabinet that is a safety component in the

sense of the Machinery Directive, will be subject to the Machinery Directive.

⁴ From 20th April, 2016, onwards: 2014/34/EC

⁵ From 20th April, 2016, onwards: 2014/35/EC

⁶ From 20th April, 2016, onwards: 2014/35/EC

⁷ <http://www.eup-network.de/product-groups/overview-ecodesign/>

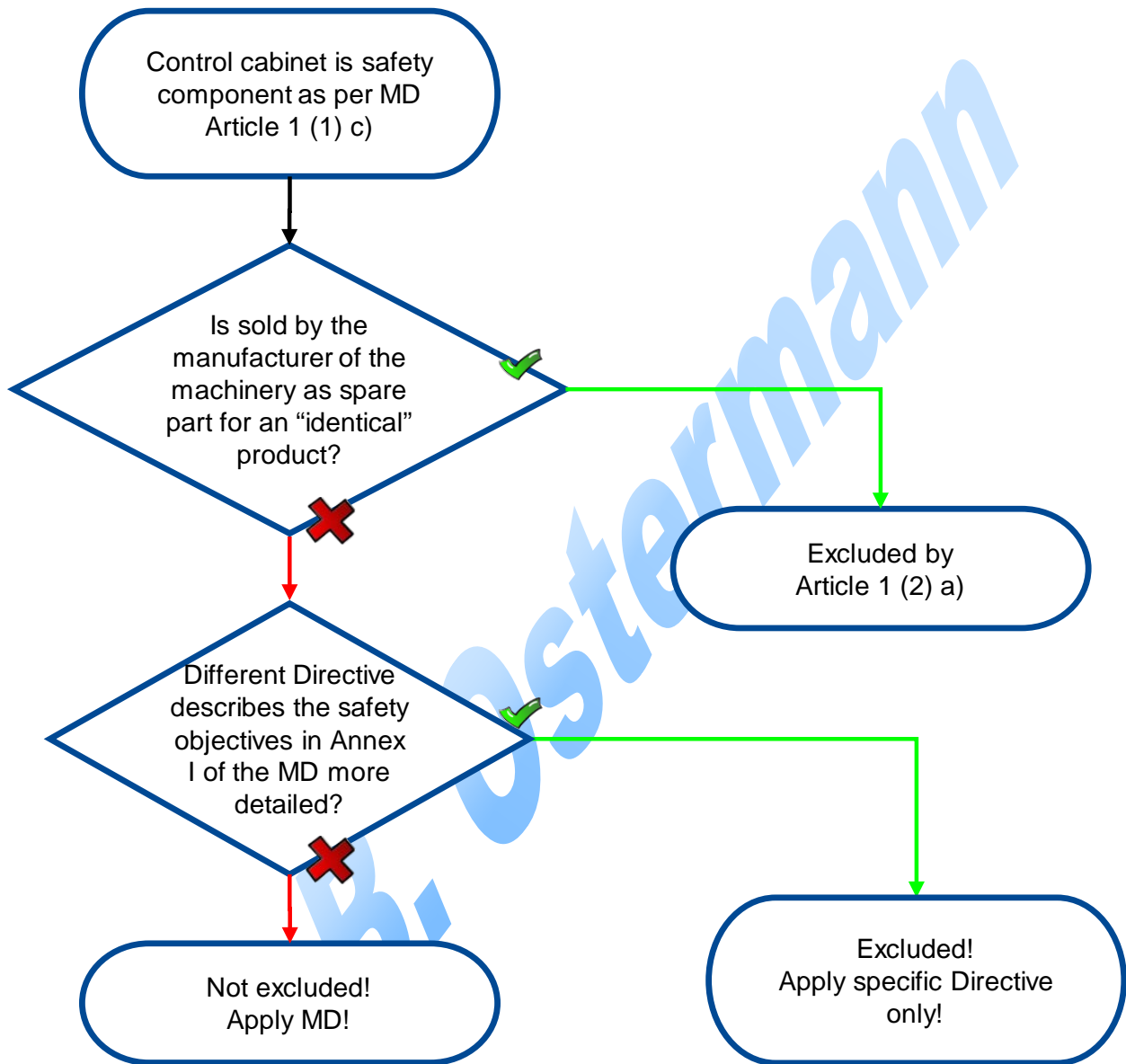


Figure 2: Routing diagram of decisions regarding exclusions of control cabinets from the Machinery Directive

4 Official Statements

The following official statements were submitted to the author of this report; they support the above interpretation:

Commission of the EC

The Commission of the EC delivered the following statement by e-mail⁸

concerning the classification of this product in view of the application of the Machinery Directive on control cabinets at the time of being placed on the market:

[...] If the product concerned is not a control system but a component of such a system intended for controlling one or more safety functions, it is a safety component.

Federal Ministry of Labour and Social Affairs (Berlin)

This Ministry is competent for the Machinery Directive and the Low-Voltage Directive. Their statement⁹ regarding the classification of a control cabinet is as follows (translated from German text; for original wording see

⁸ e-mail dated 27th Jan., 2011

⁹ e-mail dated 2nd March, 2011

German version of this report):

[...] Concerning the question which Directive is applicable to “control cabinets”, my opinion is:

[...]

Applicability of the EC Machinery Directive 2006/42/EC for control cabinets being put on the market independently:

In Article 1 paragraph 2, the Machinery Directive excludes low-voltage switchgears and control gears from its scope provided that they are governed by the LVD¹⁰ and do not fall within the scope of the Machinery Directive. The consequence of this fact together with previous explanations is that such control cabinets are governed by the LVD and not by the Machinery Directive. Moreover, a declaration of incorporation is obsolete for control cabinets. They are – by definition – not a partly completed machine in the sense of the Machinery Directive.

However, if the control system (control cabinet) is a safety control, it is classified as a

safety component in accordance with the Machinery Directive.

The manufacturer, prior to placing his product on the market, has to meet the requirements of the Machinery Directive which includes e.g. the EC declaration of conformity as per Machinery Directive as well as operating instructions. In this case, only the safety objectives of the LVD will be applicable as per Annex I No. 1.5.1 of the Machinery Directive.

[...]

5 Consequences of placing a control cabinet on the market

The provisions of Article 5 (1) of the Machinery Directive have to be observed if the control cabinet corresponds to the definition of a safety component as per Machinery Directive and is not one of the exclusions described.

Article 5 (1) demands the following:

The manufacturer or his authorized representative shall – prior to placing machinery on the market or putting it into service –

(a) ensure that it satisfies the relevant essential health and safety requirements set out in Annex I;

*(b) ensure that the **technical file** referred to in Annex VII, Part A is available;*

*(c) provide, in particular, the necessary information such as **operating instructions**;*

*(d) carry out the appropriate **procedures for assessing conformity** in accordance with Article 12;*

*(e) draw up the **EC declaration of conformity** in accordance with Annex II, Part 1, Section A and ensure that it accompanies the machinery;*

*(f) affix the **CE marking** in accordance with Article 16.*

The overall requirements of the Low-Voltage Directive (CE marking, EC declaration of conformity) are not applicable in this case. However, the safety objectives of the Low-Voltage Directive have to be met in the framework of the Machinery Directive.

The requirements of any other Directive the scope of which includes also control

¹⁰ LVD = Low-Voltage Directive

cabinets, have to be met additionally.

6 Literature

- Machinery Directive
2006/42/EC
- Guide to application of the
Machinery Directive
2006/42/EC, 2nd Edition
- www.maschinenrichtlinie.de

Author

Dr.-Ing. Björn Ostermann

www.maschinenbautage.eu

Niederkassel, 31st July, .2011, updated 11th Dec., 2015

Translation

Dipl.-Ing. Monika Paduch

www.monika-paduch.de

Feusdorf, 11th Dec., 2015