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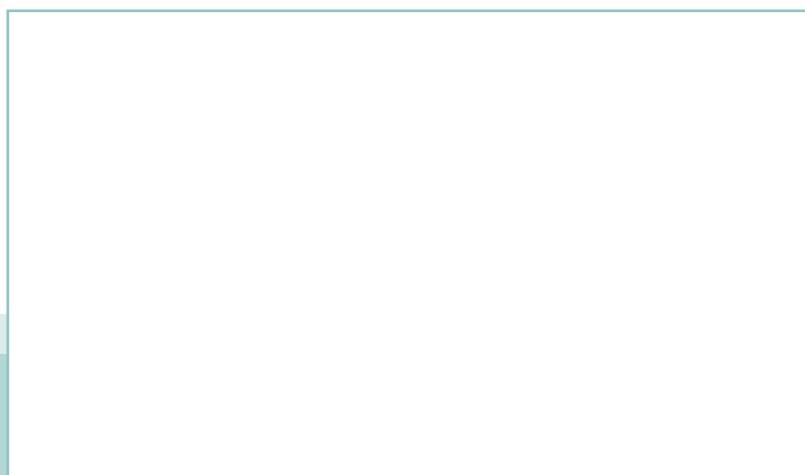
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Safety of machinery – Ergonomics requirements for the design of displays and control actuators – Part 4: Location and arrangement of displays and control actuators



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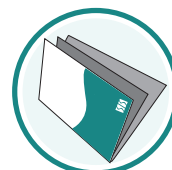
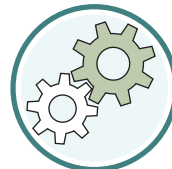
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Denna standard är framtagen av kommittén för Ergonomi vid Människa - Systeminteraktion, SIS/TK 380/AG 2.

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 894-4

June 2010

ICS 13.110; 13.180

English Version

Safety of machinery - Ergonomics requirements for the design of displays and control actuators - Part 4: Location and arrangement of displays and control actuators

Sécurité des machines - Spécifications ergonomiques pour la conception des dispositifs de signalisation et organes de service - Partie 4: Agencement et arrangement des dispositifs de signalisation et organes de service

Sicherheit von Maschinen - Ergonomische Anforderungen an die Gestaltung von Anzeigen und Stellteilen - Teil 4: Lage und Anordnung von Anzeigen und Stellteilen

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 894-4:2010) has been prepared by Technical Committee CEN/TC 122 "Ergonomics", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2010, and conflicting national standards shall be withdrawn at the latest by December 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

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Introduction

This European Standard has been prepared to be a harmonized standard in the sense of the Machinery Directive and the associated EFTA regulations.

This document is a type B standard as stated in EN ISO 12100.

The provisions of this document can be supplemented or modified by a type C standard.

NOTE For machines which are covered by the scope of a type C standard and which have been designed and built according to the provisions of that standard, the provisions of that type C standard take precedence over the provisions of this type B standard.

1 Scope

This European Standard contains ergonomic requirements for the location and arrangement of displays and control actuators in order to avoid hazards associated with their use.

This European Standard applies to displays and control actuators for machinery and other interactive equipment (e.g. devices and installations, instrument panels, control and monitoring consoles).

This European Standard is not applicable to the location and arrangement of displays and control actuators which are manufactured before the date of its publication as EN.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 614-1, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles*

EN 894-1:1997+A1:2008, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 1: General principles for human interactions with displays and control actuators*

EN 894-2:1997+A1:2008, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 2: Displays*

EN 894-3, *Safety of machinery — Ergonomics requirements for the design of displays and control actuators — Part 3: Control actuators*

EN ISO 9241-11, *Ergonomic requirements for office work with visual display terminals (VDTs) — Part 11: Guidance on usability (ISO 9241-11:1998)*

EN ISO 9241-110, *Ergonomics of the human-system interaction — Part 110: Dialogue principles (ISO 9241-110:2006)*

EN ISO 12100-1:2003 *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology (ISO 12100-1:2003)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100-1:2003 and the following apply.

3.1

control/display ratio

C/D ratio

ratio of the movement of a control actuator to that of an associated element, display or controlled object

3.2

elements

generic term for displays and control actuators on consoles and panels

3.3

primary element

element frequently used for direct operation and monitoring of the system which includes safety and emergency related elements

3.4**secondary element**

element not frequently used for the direct operation of a system

EXAMPLE The time and duration of use can be freely selected.

3.5**grouping**

arrangement of several elements of a system in such a way that they appear to be associated functionally

3.6**coding**

procedure within the design process by which categories of information (e.g. form, colour, etc.) are allocated to elements for the purpose of reliable identification

3.7**arrangement**

way of combining or separating displays and control actuators relative to their function, task and/or location

3.8**surface**

surface on which elements are positioned and arranged, considering task priorities, information flows, and space constraints

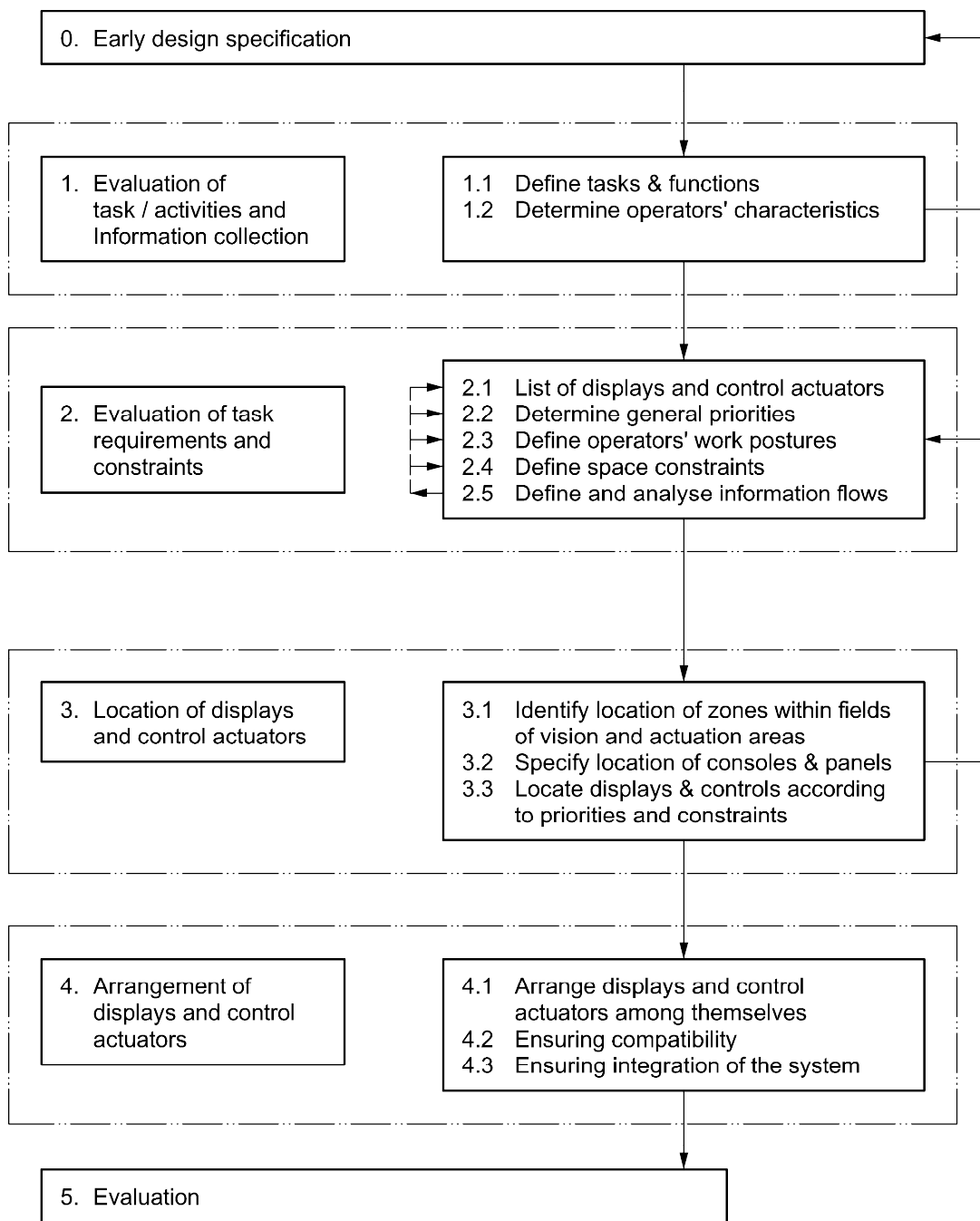
4 Principles for location and arrangement of displays and control actuators

The location and arrangement of displays and control actuators are intended to ensure the general reliability, safety and efficiency of the human-machine system. The most important tasks of the operator are to monitor, control and ensure continuous availability of the technical system and the interaction of its elements. This shall place the operator in a position to fulfil the following functions correctly and on time without becoming overtaxed:

- to perceive the current tasks;
- to control the operation;
- to select and/or develop suitable action strategies.

Basic principles for human machine interaction are given in EN 894-1.

The following describes a design procedure that will assist designers and manufacturers in complying with the requirements in this standard. It consists of six main phases, each of which contains several more detailed steps. These steps should be carried out iteratively until the requirements are met. The procedure is illustrated in Figure 1. In Phase 0 the initial information about the overall purpose, design goals and roles of the operators (see EN 894-1) is assembled.



Key

-----> Possible iteration

Figure 1 — Design procedure for location and arrangement

NOTE For details of each step see Clause 5 (e.g. step 1.1 is in 5.1.1; step 3.1 in 5.3.1).