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# Electrical equipment for furnaces and ancillary equipment - Part 1: Requirements for application design and installation

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN 50156-1

July 2015

ICS 27.060.01

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English Version

# Electrical equipment for furnaces and ancillary equipment - Part 1: Requirements for application design and installation

Equipements électriques d'installation de chaudière - Partie 1: Règles pour la conception, pour l'application et l'installation

Elektrische Ausrüstung von Feuerungsanlagen und zugehörige Einrichtungen - Teil 1: Bestimmungen für die Anwendungsplanung und Errichtung

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# European foreword

This document (EN 50156-1:2015) has been prepared by CLC/BTTF 132-2 “Revision of EN 50156 “Electrical equipment for furnaces and ancillary equipment” in cooperation with the National Committee DKE/K 232.

The following dates are fixed:

| | | |
|---|---|---|
| • latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2016-01-26 |
| • latest date by which the national standards conflicting with this document have to be withdrawn | (dow) | 2018-01-26 |

This document supersedes EN 50156-1:2004.

EN 50156-1:2015 includes the following significant technical changes with respect to EN 50156-1:2004:

- harmonization of the definitions to the new version of EN 61508;
- check and updating of the normative references;
- elimination of all normative references to the machinery directive 2006/42/EC;
- alignment to the requirements for safety related system to EN 12952 and EN 12953;
- modifications in Clause 10.

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

This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD - 2006/95/EC).

Requirements of this standard covers the essential safety requirements for limiting devices in the scope of this standard which are safety accessories in the sense of pressure equipment directive 97/23/EG, which are classified in the category II and higher.

This standard is the first part of a series of European standards which specify the requirements for equipment of safety functions for furnaces, especially safety related system to protect personnel, the furnace with ancillary equipment against hazards related to heat generation, the heated system and to operate reliably during normal conditions, and abnormal conditions which can be foreseen.

This European Standard has been prepared by the German National Committee with the participation of experts of other National Committees on the basis of CLC/BT(DE/NOT)140. It is divided into 3 parts under the generic title “*Electrical equipment for furnaces and ancillary equipment*”:

- Part 1: Requirements for application design and installation;
- Part 2: Requirements for design, development and type approval of safety-relevant equipment;
- Part 3: Requirements for plant-specific tests of safety-relevant equipment.

This European Standard is based on the EN 61508:2010 “*Functional safety of electrical/electronic/programmable electronic safety-related systems*”, Parts 1 to 7 as a basic safety standard.

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# Introduction

This part of the European Standard EN 50156 specifies the requirements and recommendations for the application design and installation of electrical and control equipment for furnaces and ancillary equipment and for the systems heated by the thermal energy released in the furnace to ensure:

- safety of personnel, property and the environment;
- consistency of proper function.

The operating conditions of the furnace, the hazards of combustion and the safety of heated systems are considered.

A safety-related system consisting of safety devices for:

- monitoring of flames and other safety conditions of the firing;
- interrupting the flow of fuel to the furnace;
- ventilating the body of the furnace and the flue gas ducts;
- monitoring of the safety condition of the heated systems (e.g. water level limiter in steam boilers);

may be necessary to ensure proper ignition and combustion of fuel and to avoid the development, existence and/or ignition of an explosive mixture of fuel and air, and also to avoid damage to the heated systems (see 3.25).

The rating of necessary safety integrity levels is based on EN 61508-1.

Figure 1 is provided as an aid to understanding the relationship between the various elements of furnaces and their ancillary equipment, the heated systems, the control system and the safety-related systems.

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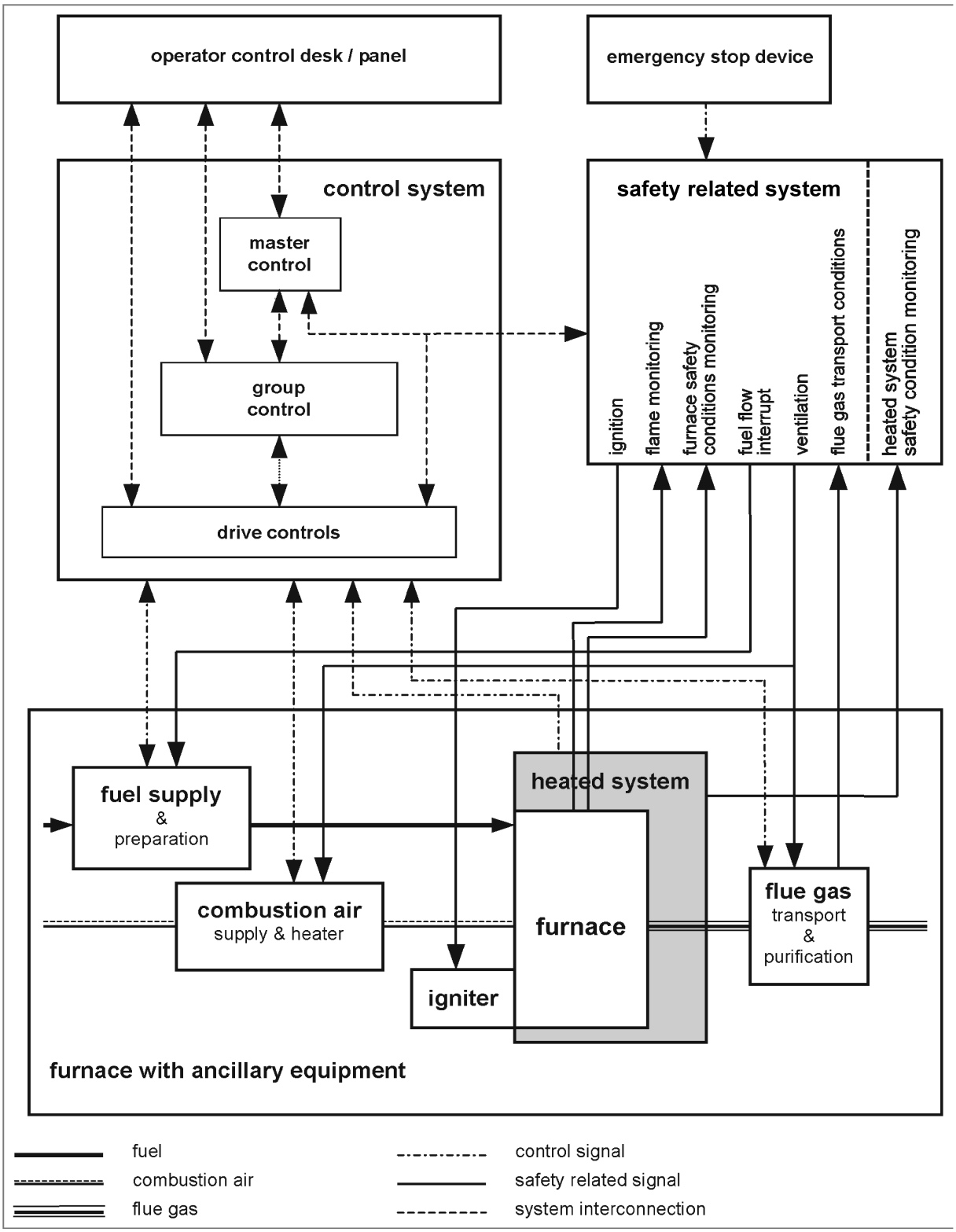


**Figure 1 – Example of the functionality of a furnace with ancillary equipment, heated systems and relationship to control system and safety related system**

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# 1 Scope

This European Standard applies to the application design and installation of electrical equipment, control circuits and safety-related systems for furnaces which are operated with solid, liquid or gaseous fuels and their ancillary equipment. It specifies requirements to meet the operating conditions of furnaces, to reduce the hazards of combustion and to protect the heated systems from damage e.g. by overheating.

Such furnaces and the electrical equipment may be part by way of example of the following plant:

a) water heating systems;

b) steam boiler installations (steam and hot-water boilers) and heat recovery steam boilers;

NOTE 1 The requirements of this standard apply according to the electrical equipment of electrically heated steam boilers.

NOTE 2 Seagoing vessels and offshore facilities are governed by International Maritime Law and as such are not within the scope of this standard. These requirements may be used for such facilities.

c) warm air heaters;

d) hot-gas heaters;

e) heat exchanger systems;

f) combustion chambers of stationary turbines;

g) as long as no other standard is applicable for combined heat and power stations, we recommend the use of the requirements of this standard;

h) This standard may also be used as reference for electrical equipment requirements for thermo-processing equipment.

The requirements in this standard are not applicable to electrical equipment for:

i) non-electrically heated appliances and burner control systems for household and similar purposes;

j) furnaces using technologies for the direct conversion of heat into electrical energy;

k) combustion chambers of non-stationary prime movers and turbines;

l) central oil supply systems for individual heating appliances;

m) furnaces using solid fuels for heating purposes for household use with a nominal thermal output up to 1 MW;

n) furnaces which are used to heat process fluids and gasses in chemical plant.

This European Standard may be used as a basis for the requirements placed on electrical equipment for furnaces, which are excluded from its field of application.

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