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**General safety code for industrial
combustion furnaces — Part 3: Protective
systems**

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Foreword

This Japanese Industrial Standard has been established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee according to the proposal for establishment of Japanese Industrial Standard submitted by Japan Industrial Furnace Manufacturers Association (JIFMA)/Japanese Standards Association (JSA) with a draft being attached, based on the provision of Article 12, paragraph (1) of the Industrial Standardization Act. This Standard partially replaces **JIS B 8415:2008**, which has been withdrawn.

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Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, published patent application or utility model rights. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying any of such patent rights, published patent application or utility model rights.

JIS B 8415 series consists of the following 3 parts under the general title *General safety code for industrial combustion furnaces* — :

Part 1: General requirements

Part 2: Combustion and fuel handling systems

Part 3: Protective systems

General safety code for industrial combustion furnaces — Part 3 : Protective systems

Introduction

This Japanese Industrial Standard has been prepared based on **ISO 13577-4** : 2014, Edition 1, with some modifications of the technical contents to corresponding to the actual situations in Japan.

The vertical lines on both sides and dotted underlines indicate changes from the corresponding International Standard. A list of modifications with the explanations is given in Annex JD. Annex JA, Annex JB and Annex JC are unique to **JIS** and not given in the corresponding International Standard.

This Standard was developed to specify the requirements of a protective system, which is a safety-related electrical control system (SRECS) of industrial combustion furnaces and associated devices (hereafter referred to as the combustion furnaces).

Mandatory safety-related control functions of combustion furnaces are specified in other parts of **JIS B 8415**.

It is intended that in designing the protective system of combustion furnaces, manufacturers of combustion furnaces choose from the four methods provided in this Standard.

This Standard is a type-C standard as defined in **JIS B 9700**.

This Standard is to be used together with the other parts of **JIS B 8415**. Since **JIS B 8415** series is a type-C standard of **JIS B 9700**, the combustion furnaces are required to be designed in accordance with the principles of **JIS B 9700**. However, there are cases in which a risk assessment according to **JIS C 0511** is more suitable for the design of a combustion furnace protective system. The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the scope of this Standard.

When requirements of this type-C standard are different from those which are stated in type-A or -B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard.

JIS C 0511 provides the option of a low-demand rate (system for permanent operation) on the protective system. **JIS B 9961** and **JIS B 9705-1** always assume high-demand rate (system for non-permanent operation) applications. Therefore, this Standard permits extended risk assessment for SRECS in which risk assessment based on **JIS C 0511** may be chosen as an alternative.

1 Scope

This Standard specifies the requirements for protective systems used in industrial combustion furnaces and associated devices.

The safety functional requirements to which the protective systems apply are specified in Part 1 and Part 2 of **JIS B 8415**.

NOTE The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 13577-4 : 2014 *Industrial furnace and associated processing equipment — Safety — Part 4 : Protective systems (MOD)*

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS B 3503 *Programmable controllers — Programming languages*

NOTE Corresponding International Standard : IEC 61131-3 *Programmable controllers — Part 3 : Programming languages*

JIS B 9705-1 *Safety of machinery — Safety-related parts of control systems — Part 1 : General principles for design*

NOTE Corresponding International Standard : ISO 13849-1 *Safety of machinery — Safety-related parts of control systems — Part 1 : General principles for design*

JIS B 9960-1 *Safety of machinery — Electrical equipment of machines — Part 1 : General requirements*

NOTE Corresponding International Standard : IEC 60204-1 *Safety of machinery — Electrical equipment of machines — Part 1 : General requirements*

JIS B 9961 *Safety of machinery — Functional safety of safety-related electrical, electronic and programmable electronic control systems*

NOTE Corresponding International Standard : IEC 62061 *Safety of machinery — Functional safety of safety-related electrical, electronic and programmable electronic control systems*

JIS C 0508 (all parts) *Functional safety of electrical/electronic/programmable electronic safety-related systems*

NOTE Corresponding International Standard : IEC 61508 (all parts) *Functional safety of electrical/electronic/programmable electronic safety-related systems*

JIS C 0511 (all parts) *Functional safety — Safety instrumented systems for the*