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ELECTRICAL EQUIPMENT FOR COAL MINES—
TRANSFORMER SUBSTATIONS FOR USE UNDERGROUND

STANDARDS ASSOCIATION OF AUSTRALIA
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Institute of Mining Electrical and Mining Mechanical Engineers

Australian Coal Association

Australian Electrical and Electronic Manufacturers Association

Confederation of Australian Industry

Department of Industrial Relations, N.S.W.

Department of Mines, Qld

Elcom Collieries, N.S.W.

Joint Coal Board

Queensland Confederation of Industry

State Energy Commission of Western Australia

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TRANSFORMER SUBSTATIONS FOR USE UNDERGROUND

AS 1740—1985

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PREFACE

This edition of this standard was prepared by the Association's Committee on Electrical Equipment for Coal Mines to supersede AS 1740-1975, Transformer Substations for Use Underground in Coal Mines.

The purpose of this edition is to update the requirements and takes account of new design parameters and current user needs.

The major changes include—

(a) the separation of sections covering non-explosive atmospheres and explosive atmospheres;

(b) the addition of new requirements for substations for use in non-explosive atmospheres; and

(c) the addition of routine tests.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

for

ELECTRICAL EQUIPMENT FOR COAL MINES— TRANSFORMER SUBSTATIONS FOR USE UNDERGROUND

SECTION 1. SCOPE AND DEFINITIONS

1.1 SCOPE. This standard specifies requirements for mining type transformer substations (hereinafter referred to as a substation(s)) for use in non-explosive atmospheres and explosive atmospheres and intended primarily for supplying power to machinery below ground in coal mines.

NOTE: A substation may consist of a transformer together with associated high voltage (HV) and low voltage (LV) electrical equipment, the whole assembly being mounted on wheels or on a skid to facilitate frequent moving.

1.2 APPLICATION. All substations shall comply with the requirements of Sections 2 and 5.

Substations intended for use in non-explosive atmospheres shall, in addition, comply with Section 3.

Substations intended for use in explosive atmospheres shall, in addition, comply with Section 4.

1.3 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 1029 Low Voltage Contactors

AS 1042 Direct-acting Indicating Electrical Measuring Instruments and their Accessories

AS 1147 Plastics Insulating Materials of Mouldings for Cable Connecting Devices for Use in Coal Mines

AS 1299 Flameproof Restrained Plugs and Receptacles for Use in Coal Mines

AS 1300 Electrical Equipment for Coal Mines—Bolted Flameproof Cable Coupling Devices

AS 1825 Electrical Equipment for Explosive Atmospheres—Pressurized Enclosures—Type of Protection p

AS 1828 Cable Glands for Explosive Gas Atmospheres

AS 1864 High Voltage Alternating Current Contactors

AS 1930 Circuit-breakers for Distribution Circuits (Up to and Including 1000 V a.c. and 1200 V d.c.)

AS 1931 High Voltage Testing Techniques
Part 1—General Definitions, Test Requirements, Test Procedures and Measuring Devices
Part 2—Application Guide for Measuring Devices

AS 1939 Classification of Degrees of Protection Provided by Enclosures for Electrical Equipment

AS 1972 Cables for Use Below Ground in Coal Mines (Other than Trailing Cables)

AS 2006 High Voltage Alternating Current Circuit-breakers

AS 2081 Earth-fault Protection, Monitoring and Current Limitation Equipment for Use in Coal Mines and Shale Mines.

AS 2184 Moulded-case Circuit-breakers (Up to and Including 600 V a.c. and 250 V d.c.) (Interrupting Rating 10 KA and More)

AS 2374 Power Transformers
Part 1—General Requirements

AS 2480 Electrical Equipment for Explosive Atmospheres—Flameproof Enclosure—Type of Protection d

AS 3100 Approval and Test Specification for Definitions and General Requirements for Electrical Materials and Equipment

AS 3111 Approval and Test Specification for Miniature Overcurrent Circuit-breakers

AS 3135 Semi-enclosed Fuses for a.c. Circuits

1.4 DEFINITIONS. For the purpose of this standard, the following definitions apply:

1.4.1 Access cover—a cover which performs the following functions:

(a) requires frequent removal or opening of the cover for maintenance purposes; or

(b) provides access to electrical equipment that—

(i) may require adjustment or alteration; or

(ii) is used to make and break load current under normal conditions

1.4.2 Adaptor—any device designed to connect one or more cable coupling units to apparatus. It may either be attached to or be integral with the apparatus, and may have provision for filling.

NOTE: The term 'adaptor' also includes the unit to connect other types of cable terminations to apparatus.

1.4.3 Apparatus—all electrical appliances, machines and fittings in which conductors are used or of which they form a part.

1.4.4 Approved—means approved by the Regulatory Authority.

1.4.5 Circuit interruptor—a device capable of making, carrying and breaking normal load currents and also making and automatically breaking (under predetermined conditions) abnormal currents, such as short-circuit currents.

1.4.6 Contactor—a device having one position of rest, operated other than by hand, usually designed for frequently making and breaking the normal operating current including operating overloads.

1.4.7 'Dead front' construction—a front covering which ensures protection against contact with live parts from the front.