



24V-Ex Power Supply

INTRINSICALLY SAFE



24V-Ex Power Supply

Description of an Explosion Protected DC Power Supply

Explosion Protection for DC POWER SUPPLIES

In the manufacture, processing, transport and storage of flammable materials and petroleum products it is inevitable that there will be a leakage of gases and vapours which, in conjunction with the oxygen of the atmosphere may form mixtures of an explosive concentration. Accidental ignition of such a mixture for example by an electrical spark, mechanical scraping or excessively hot surfaces, may cause an explosion, which will endanger life and property. Electrical apparatus can ignite many explosible dusts in industry, when mixed with oxygen in the air. Since every apparatus is a potential source for an ignition, the authorities impose measures to prevent the risk of ignitions. The fact that explosions seldom occur proves that the safety measures taken are effective and successful.

Definitions

Electrical apparatus:

All apparatus used as a whole or are part responsible for the applications of electrical energy. These include items for generation, transmission, sub transmission, distribution, regulation, storage, and consumption of electrical energy and ALL apparatus for telecommunications. (In the use of explosion protected electrical equipment in hazardous locations, one must distinguish between operation, such as switching, control adjustment etc, maintenance which covers inspection, service and repair and inspection of such equipment.)

Gas Groups:

Electrical apparatus used in potentially explosive atmospheres are divided into "GROUP I", and "GROUP II".

GROUP I gases occur in mines

GROUP II gases are surfaces gases, which are even further divided into groups A, B and C.

Ex Components:

Components which are part of an electrical apparatus used in a potentially hazardous location, that may not be used on its own without additional certification together with any other Ex apparatus for intended purpose in such areas.

Explosive atmospheres:

A mixture of flammable substances in the form of a gas, vapour or mist with air under atmospheric conditions in such proportions that it can be ignited by excessive temperature arcs or sparks.

Explosion Hazard Zones:

All areas in which, potentially explosive atmospheres may occur in hazardous quantities are deemed to be Explosion-hazard zones. According to the probability, in terms of time and location, of the presence of potentiality explosive atmospheres, these potentially explosive atmospheres are divided in Zones, which allow differentiated evaluation of the explosion hazard. Since the concentration decrease with the increasing distances from the source of risk, the location of the source of risk is very important for the Zone Classification.

ZONE 0 (Formerly class 1 division 0):

Atmosphere is continuously explosive.

Common examples:

Volume above volatile liquid in a tank with a fixed roof or 150mm above a solvent or volatile liquid in open air.

Yardstick in hours per year: 1000 hours plus

ZONE 1 (Formally Class 1 Division 1)

Likely to be explosive under normal operating conditions

Common Examples:

Opening or closing Valves taking samples, small mechanical repairs or adjustments.

Yardstick in hours per year: 10-1000 hours

ZONE 2 (Formally Class 1 Division 2)

Explosive under Abnormal conditions only even then for short periods.

Common Examples: Construction mechanically strong, chances of leaks very remote.

Yardstick in hours per year: Up to 10 Hours per year in total

ZONE 20

An Area, in which combustible dusts, as a cloud, is present continuously or frequently, during normal operation. In sufficient quantity to be capable of producing an explosive concentration of combustible, dust mixed with air, and/or where layers of dust of uncontrollable and excessive thickness can be formed. This can be the case inside dust containment areas where dust can from explosive mixtures frequently or for long periods of time. This occurs typically inside equipment.

ZONE 21

An Area not classified as Zone 20 in which combustible dust, as a cloud, is likely to occur during normal operation in sufficient quantities to be capable of producing an explosive concentration of combustible dust mixed with air. This zone can include, among others, areas in the immediate vicinity of powder filling or emptying points and areas where dust layers can occur and are likely in normal operation to give rise to an explosive concentration of combustible dust mixed with air.

ZONE 22

Areas not classified as Zone 21, in which combustible dust clouds may occur infrequently, and persist for only a short period, or in which accumulation or layers of combustible dust may be present under abnormal conditions and give rise to combustible mixtures of dust with air. Where, following an abnormal condition, the removal of dust accumulations or layers cannot be assured then the area is to be classified as Zone 22. This Zone can include, among others, areas in the vicinity of equipment containing dust, which dust can escape from leaks and deposits, such as milling rooms in which dust can escape from the mills and then settle

Intrinsic safety:

Principles of I.S 'EN 50020'

A piece of electrical apparatus is only intrinsically safe, if all circuits are intrinsically safe. A circuit is only intrinsically safe if its amperage and voltage are limited in such a way (function of inductance, capacitance and resistance) that no sparks or thermal effect can occur in it. The energy of such circuits is lower than the minimum ignition energy, required igniting an explosive mixture (gas, solvent, vapour or dust). Intrinsic Safety consists of two categories "ia", and "ib". A clear distinction must be made between these two categories. Category "ia" is also required to meet more stringent requirements on the occurrence of faults and combinations of faults. Consequently "ia", is prescribed for use in Zone 0, and "ib" for use in Zone 1. "ia", also needs to maintain two faults within its own circuitry, and "ib" only requires maintaining one fault.

***Note: the colour of intrinsic safe equipment is light blue RAL5012**

NON SPARKING:

Principles of Non Sparking 'EN50021'

In the case of this protection type, special conditions are taken to ensure an increased degree of safety and to prevent the occurrence of inadmissible high surface temperatures leading to auto-ignition, sparks or arcs inside, or on external components of electrical apparatus in normal operation. Special notice is taken to maximum surface temperatures. Enclosures containing bare or live parts must comply with a degree of protection not less than IP54. Those containing only insulated parts may be designed to a degree of protection not less than IP44

**Note: 98% of all Hazardous Locations are Zone 2 locations.*

24V-Ex

The 24V-Ex is a 19 Volt, DC Power Supply. The 24V-Ex is housed in a flameproof enclosure. The 24V-Ex is suitable for underground use, having a protection class of [Ex ib] I

MODE DESCRIPTION

There are four different operation modes:

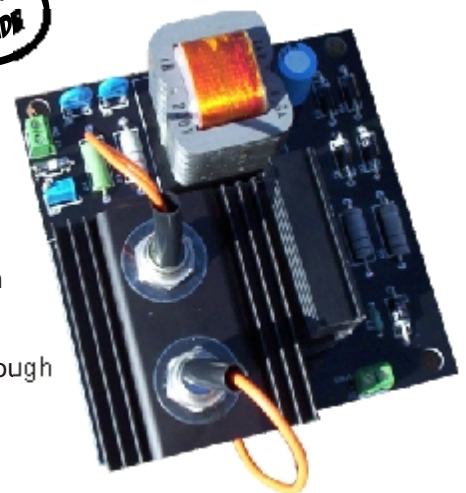
- Power off mode
- Idle mode
- Active mode
- Local mode

In the power off mode, only the circuits needed for power are supplied.

In the Idle mode circuits are supplied with the power although some parts might be in the idle state part of the time

In the active mode, all the circuits are supplied with the power although some parts might still be in the idle state part of the time.

The local mode is used for alignment and testing.





TECHNICAL SPECIFICATIONS

SUMMARY

Parameters	Unit
• Input Power	230V AC +/- 10% 150mA

OPERATING AND STORAGE TEMPERATURES

Maximum operating temperature is from -10C to +40C; Storage temperature is from -20C to +65C

CONSTRUCTION

The P.C Board is housed in a flameproof enclosure. .

Ex-MANUAL FOR THE Ronnoco Mega Lux-Ex

1. The 24V-Ex is certified as [Ex ib] I for Zone 1, and, 2 Hazardous Locations, which is an area in which the atmosphere is continuously explosive
2. **DO NOT** attempt to open the 24V-Ex to repair it. Non-Expert handling of the device is NOT permitted.

LIABILITY CLAUSE

"Notwithstanding the fact that this product has been certified by SA Prevention (Pty)LTD, Government Approved Inspection Authority, as "Explosion Protected" and as being suitable for use in hazardous locations, no liability will attach to the manufacturer or any person or party concerned with the Explosion Protection modification thereto, for any loss or damage of whatsoever nature arising from or relating to the operation or use of the product in contravention of any procedure recommended in the Product Users Manual, or arising from relating to any explosion, fire or chemical reaction caused by the use of the product".



EUROPEAN AND ASIAN COOPERATION FOR ACCREDITATION

The Ronnoco Mega Lux-Ex has automatic approval in the countries listed below:

SAS Swiss Accreditation Service Switzerland
DAR Deutscher Akkreditierungsrat
DKD Deutsch Kalibrierdienst Germany
DANAK Dansk Akkreditering Denmark
FINAS Finnish Accreditation Service Finland
COFRAC Comite Francais d'Accreditation France
ILAB Irish National Accreditation Board Ireland
BKO/OBE Belgische Kalibratie Organisatie Belgium
BELTEST- Belgisch Accreditatiessysteem Testen en Keuring Belgium
CNLA Chinese National Laboratory Accreditation Republic of China
NATA National Association of Testing Authorities Australia.
UKAS United Kingdom Accreditation Services U.K
SINAL Italy
SIT Servizio Italiano di Taratura Italy
RvA Raad Voor Accreditatie The Netherlands
NA Norwegian Accreditation Norway
SWEDAC Swedish Board for Accreditation and Conformity Assessment
ENAC Entidad Nacional de Acreditacion Spain
BMwA Austria
IPQ Instituto Portugues da Qualidade Portugal
IANZ International Accreditation New Zealand

CERTIFICATES

All Ronnoco Mega Lux-Ex Miners Cap Lamps will be issued with certificates as shown on the following page.



MANUFACTURING

Manufacturing and Modification will be performed by:

Repro Supplies c.c.
CK92/26672/23
V.A. T REG 4370193627

With Physical Address at:

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