TX6649
Intrinsically Safe Power Supply (Ex eq)

User Manual

TROLEX

TX6649 Intrinsically Safe Power Supply (Ex eq)

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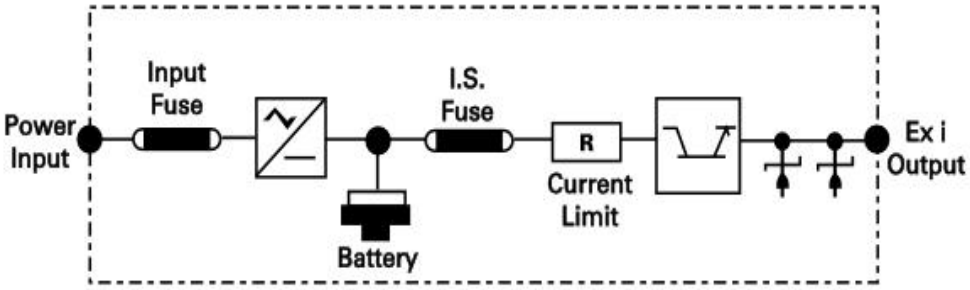
1. Product Overview

The TX6649 Power Supply converts an ac supply voltage into a stabilised and regulated Intrinsically Safe source of power to approved sensors and electronic control devices.



1.1 Operating Features

- Input voltage options: 110 V ac or 230 V ac
- Input supply is protected by two primary fuses
- Intrinsically Safe output voltage: 12 V dc
- Output circuit is resistively limited in accordance with certification standards for Intrinsically Safe, ia, equipment
- Output circuit incorporates voltage regulation, current limiting and continuous short circuit protection
- Robust stainless steel housing
- Integral 20 Ah back-up battery with automatic uninterrupted power transfer and charge to full capacity
- Output relay contact to signal power failure
- Analogue output signal to indicate battery charge condition

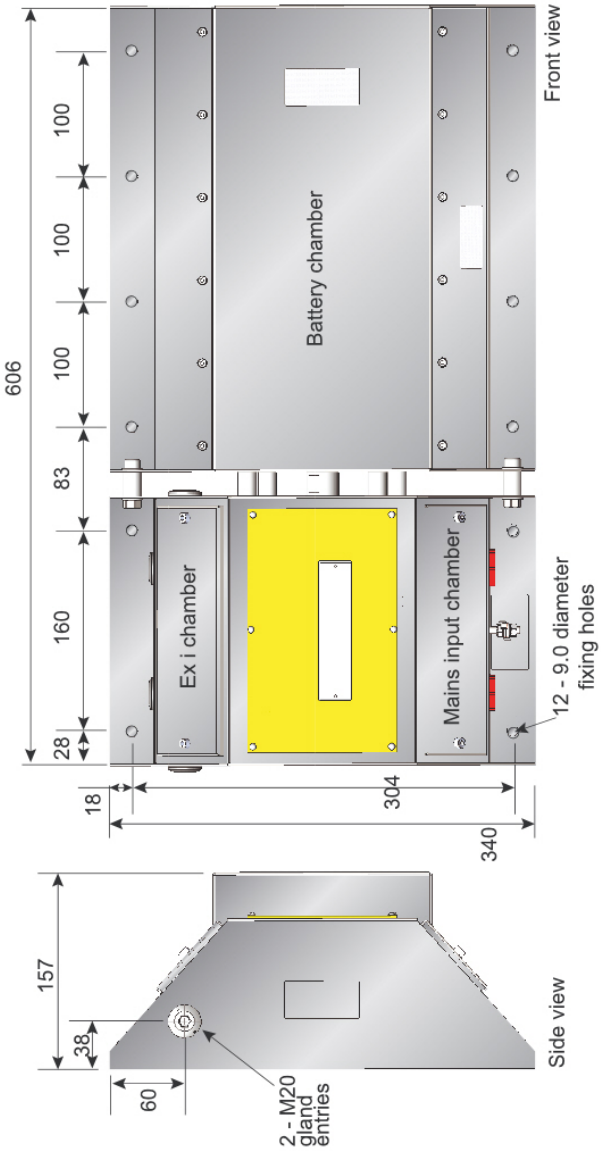
1.2 Application

- Mining
- Tunnelling

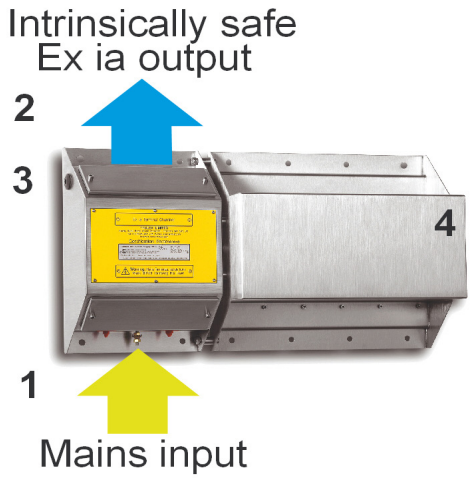
1.3 Product Options

TX6649.105.101	110 V ac input
TX6649.106.101	230 V ac input

1.4 Dimensions



1.5 Technical Information



1	Input voltage	110 V ac ± 10% or 230 V ac ± 10% - 50/60 Hz
2	Output voltage	12 V dc
	Output current	750 mA
	Output ripple/noise	150 mV max
	Line regulation	<5% over the input voltage range
	Load regulation	<5% over 0 to 90% of load current <10% between 90% and 100% of load current
	Voltage limiting	Over voltage detection with crowbar protection and short circuit protection
	Current limiting	Automatic current limiting of the intrinsically safe output also limits the current to less than the rupturing capacity of the output protection fuse.

3	Max. operating temperature	–20°C to +40°C
	Storage temperature	–20°C to +70°C
	Humidity	0 to 95% RH, non-condensing
	Vibration limits / low frequency	0.25 mm peak, sinusoidal vibration in the range 10 Hz to 100 Hz in 3 perpendicular planes
	Medium frequency	2g peak, sinusoidal vibration in the range 10 Hz to 600 Hz in 3 perpendicular planes
	Mechanical shock	1000 shocks of 40g minimum in 3 perpendicular planes
	Housing material	Stainless steel

4	Back-up battery	Sealed lead-acid. 20 Ah Automatic charge control to full capacity Automatic uninterrupted output power transfer following input power failure
	Power fail indication	Relay contacts change state on power failure. Contact rating: 0.25 A at 30 V dc max.
	Charge condition	Analogue output signal proportional to the charge level of the battery Choice of 0.4 V to 2.0 V or 4 to 20 mA signals
	Battery life	6 years at 20°C 3 years at 30°C 1.5 years at 40°C
	Net weight	35 kg
	Important note	Following initial commissioning or long periods of storage the TX6649 requires a minimum of 24 hours charge time before the batteries will be at full capacity.

2. Certification

	**Ex certified for Group I applications:** **Europe:** Ex Certificate Number: SIRA 02ATEX3419X Ex eq [ia Ma] Mb I (when mains powered) Ex ia I Ma (when battery powered) Special Conditions for Safe Use: All cables used for external connections shall be terminated by the use of suitably certified Ex e cable glands. The use of conduit is not permitted. General Conditions for Safe Use: Prior to installation, it is essential that the user refers to the above Ex certificate to ensure that the termination and cable parameters are fully complied with and are compatible with the application. Copies of certificates are available from Trolex.
	ATEX directive 94/9/EC EMC directive 2004/108/EC
	**International (IECEx):** Ex Certificate number: IECEx SIR 10.0109X Special Conditions for Safe Use: All cables used for external connections shall be made by the use of suitably certified Ex e cable glands. The use of conduit is not permitted. General Conditions for Safe Use: Prior to installation, it is essential that the user refers to the above Ex certificate to ensure that the termination and cable parameters are fully complied with and are compatible with the application. Copies of certificates are available from Trolex.

MASC	**South Africa (MASC):** Ex Certificate number: MASC M/11-315X
	Russia: GOST-R version is available. Please contact Trolex for more information

2.1 Certification Parameters

2.1.1 Input and IS Output Connections

TX6649.106.101 (230 V ac, 12 V dc, 750 mA)	
TX6649.105.101 (110 V ac, 12 V dc, 750 mA)	
Um	250 V ac
Uo	13.0 V
Io	1.76 A
Co	30.29 µF
Lo/Ro	36.17 µH/Ω
Po	12.73 W

2.1.2 Other Connections

Refer to appropriate certificate for Certification Parameters for analogue output (charge condition), relay contact and switch terminals.

See section 5 **Compliance with ATEX directives** for more information applicable to your location.

3. Installing

3.1 Safety Precautions

1. Make sure that all covers on Ex e housings and their fixing devices are properly secured in compliance with statutory regulations before switching on the input supply.
2. Never remove the cover of an Ex e housing whilst the input supply is connected. Isolate elsewhere before removing the cover in accordance with statutory regulations.
3. The housing of all power supplies must be securely earthed in compliance with statutory regulations.
4. Carry out a current consumption audit to ensure that the maximum current loading of the power supply is not exceeded.
5. Ensure that the installation of the power supply, particularly with regard to the connecting cables, complies with the certification parameters (section 2.1).
6. The Ex e housing must be inspected and maintained regularly in accordance with statutory regulations.
7. All cables entering the mains input terminal chamber must be terminated with suitable, certified cable entry devices.
8. Do not drill holes in the Ex e housing or modify it in any way.
9. The battery contains corrosive substances and must be disposed of in the correct way.
10. Please return the complete unit to Trolex or an approved distributor for servicing and replacement.

3.1.1 Handling

Checkpoint
This is a heavy item, 35 kg, and therefore safe handling and transportation should be applied in line with the health and safety recommendations on your site.

3.2 Tools and Test Equipment Required

No special tools are needed.

3.3 Siting Recommendations

1. The TX6649 may be located in a hazardous area with flammable gases and vapours with Group I apparatus.
2. The equipment is only certified for use in ambient temperatures in the range –20°C to +40°C and should not be used outside this range.
3. Installation shall be carried out in accordance with the applicable code of practice by suitably trained personnel.

3.3.1 Positioning Recommendations

Mount horizontally as shown in the illustrations on pages 4 and 7.

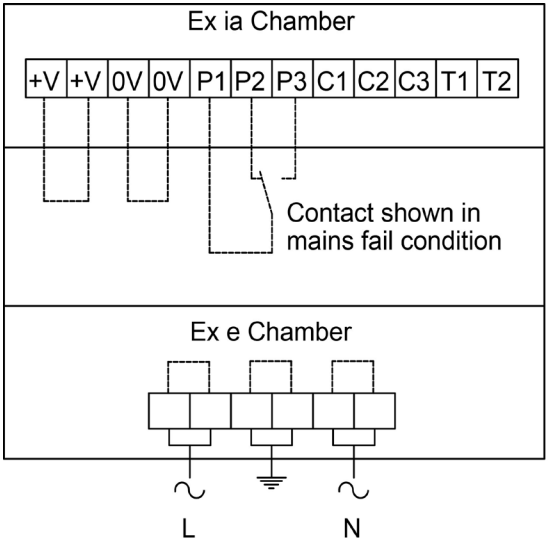
3.3.1.1 Power Requirements

See Technical Details section 1.5.

3.3.1.2 Output Signal

0.4 to 2 V dc	Battery charge level monitor
4 to 20 mA	Battery charge level monitor
Relay	Mains fail output contact

3.4 Connections



+V = 12 V dc
0V = 0V
} IS output

P1 = C
P2 = N/C
P3 = N/O
} Mains Fail Output (IS only)

C1 = 0.4 to 2V
C2 = 0V
C3 = 4 to 20mA
} Battery Charge Level Output (IS only)

T1 = Not Used
T2 = Not Used

3.4.1 Group 1 Areas

Connecting cables must conform to the requirements of the appropriate Approval and Certification standards for Mining applications. Trolex recommends that they conform to BS5308.

4. Maintenance

Make periodic visual inspections to check for physical damage.

Check connections in both terminal chambers are secure.

4.1 Technical Maintenance

Trolex recommends that the batteries are replaced every three years. This must be carried out by a competent person. If the unit is returned to Trolex for this re-work, a test of the internal safety integrity will also be carried out.

4.2 Troubleshooting

4.2.1 Warranty

See Terms and Conditions for the Supply of Goods and/or Services at www.trolex.com.

4.2.2 Diagnostics

Condition:	`Output reading of 800mV instead of 12Vdc.`
Diagnosis:	The internal safety crowbars have activated due to an external condition on the input voltage or output side, the crowbars will attempt to automatically reset. If this does not happen remove main power for about 2 minutes.
Condition:	`The output has dropped to zero`
Diagnosis:	It is probable that the input fuses have ruptured which has resulted in the batteries completely discharging. To check this, remove main power momentarily. If the relay does not change state then it confirms the unit is continuously operating on the battery supply only.

4.2.3 Connectivity

Check the correct function of the mains-fail relay by connecting a suitable test meter across the contacts.

A 12 V dc output should be available at the intrinsically safe output terminals with mains power input present, or absent.

Also check that the analogue battery monitoring signal is available at the output terminals.

4.2.4 Support

If you need technical support to operate this product, or would like details of our after sales technical support packages, contact **service@trolex.com**.

5. Compliance with ATEX Directives

Instructions specific to hazardous area installations (reference European ATEX Directive 94 /9/EC, Annex II, 1.0.6.)

The following instructions apply to equipment covered by certificate numbers SIRA 02ATEX3419X:

The TX6649 (SIRA 02ATEX3419X) may be located in a hazardous area with flammable gases and vapours with Group I apparatus.

The equipment is only certified for use in ambient temperatures in the range –20°C to +40°C and should not be used outside this range.

Installation shall be carried out in accordance with the applicable code of practice by suitably trained personnel.

Replacement of fuses or repair of this equipment shall be carried out in accordance with the applicable code of practice.

Certification marking as detailed in drawing numbers P5531.09.

If the equipment is likely to come into contact with aggressive substances, then it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised.

Aggressive Substances: e.g. acidic liquids or gases that may attack metals or solvents that may affect polymeric materials.

Suitable Precautions: e.g. regular checks as part of routine inspections or establishing from the material's data sheet that it is resistant to specific chemicals.

Disclaimers

The information provided in this document contains general descriptions and technical characteristics of the performance of the product. It is not intended as a substitute for and is not to be used for determining suitability or reliability of this product for specific user applications. It is the duty of any user or installer to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use. Trolex shall not be responsible or liable for misuse of the information contained herein. If you have any suggestions for improvements or amendments, or find errors in this publication, please notify us at **marketing@trolex.com**.

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only Trolex or its affiliates should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Trademarks

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Document History

Issue 1	20 July 2005	Original publication of this document
Issue 2	6 September 2013	New format and minor revisions

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