



Title

INTRINSICALLY SAFE Ex ia PSU TYPE AC36W USER MANUAL

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2 INTRODUCTION

This document specifies and describes the correct installation, operation, and servicing of the Austdac PSU Type AC36W.

3 GENERAL DESCRIPTION

The power supply type AC36W is an intrinsically safe power supply that has a nominal output voltage of 12 volts DC and an output current of up to 3.3A or 16V DC and an output current of up to 1A. The AC36W is an active power supply. The type AC36W is suitable for use in Group I and Group IIB applications. The AC36W power supply may be used to power intrinsically safe apparatus located in zone 0, 1 or 2.

The AC36W power supply can be powered from a nominal 100V or 240V AC power source to suit most applications in underground coalmines. The output of the power supply is galvanic isolated from the mains input and earth.

The AC36W is designed to be located in a safe area or within a minimum IP55 enclosure capable of provide mechanical protection to the AC36W. The AC36W has an IP55 ingress protection rating excluding the input and output connectors.

The AC36W comes in the following configurations and variations;

| | |
|-----------------|--|
| AC36W-xxV-yyA | This version uses Phoenix Ex e terminals rated to $U_m = 175V$. |
| AC36W-W-xxV-yyA | This version uses Wago Ex e terminals rated to $U_m = 250V$ or $265V$. Check Label on the product. |
| AC36W-C-xxV-yyA | This version uses an integral cable and it rated to $U_m = 250V$ or $265V$. Check Label on the product. |

Where xxV indicates the voltage output and yyA indicates the current output.

For each AC36W the voltage and current variations are;

Group I

| | |
|-------|------------------------------|
| 12.6V | 0.1A to 1.0A in 0.05A steps |
| 12.6V | 1.05A to 3.3A in 0.05A steps |
| 16V | 0.1A to 0.5A in 0.05A steps |
| 16V | 0.55A to 1.0A in 0.05A steps |

Group IIB

| | |
|-------|-----------------------------|
| 12.6V | 0.1A to 1.5A in 0.05A steps |
|-------|-----------------------------|

4 WARNINGS AND PRECAUTIONS

WARNING

- Lethal voltages and currents are present within the AC36W.
- Mains voltages are present within the AC36W.
- DC Voltages greater than 300V may be present within the AC36W.
- The AC36W must be earthed.
- An assembled AC36W weighs in excess of 3kg.

PRECAUTIONS

- Only qualified personnel shall install and service the AC36W.
- Use personal protection equipment.
- Ensure that earth connections are tested.

4.1 USER ACCESS

There are no user serviceable parts within the AC36W. The user should not open or disassemble the AC36W.

4.2 STORAGE, INSTALLATION, USE AND MAINTAINANCE REQUIREMENTS

The AC36W should only be installed, operated and maintained by qualified personnel in accordance with the condition of safe use as outlined in the certificate IECEx MSC 13.0001X and IECEx KEM 07.0019U (Ex e component certified terminal block) or ATEX Presafe 14 ATEX 4846X or MSHA Intrinsic Safety Evaluation No. 18-ISA170002-0.

Ensure that all instructions and warnings are observed.

4.2.1 Storage

The specified operating temperature must be maintained during storage.

4.2.2 Installation and conditions of use

Prior to installation the AC36W should be inspected for the following;

- Any external damage to the enclosure.
- Any damage, score marks or foreign debris to any connectors.
- Confirm that the continuity of the earthing of the AC36W, case and external protective earths is less than 0.1 ohms and of a suitably rated cable.



For improved cooling the AC36W should be mounted onto a metal plate in a ventilated area.

The AC36W may be installed in any orientation.

The AC36W must be installed in a suitably certified enclosure that provides adequate protection, from impact and ingress of dust and water, to the Ex e terminal block.

The AC36W should be mounted to a stable surface avoiding areas under constant vibration and shock.

Ensure that the AC36W is adequately secured to the mounting area.

Ensure the markings on the power supply be visible for inspection after final installation.

Do not use any plugs & receptacles that are interchangeable on the product.

Ensure the wiring from the IS terminals of the power supply have an insulation rating greater than 1500 volts rms when installed.

Ensure the wiring from the IS terminals is segregated (within the same wire bundle) from other wiring within the product or by enclosing either type of wiring in grounded shield capable of carrying the fault current that would flow if the non-intrinsically safe circuit were to become connected to the shield.

4.2.2.1 MSHA Special Conditions

Under installations governed by a MSHA certificate the AC36W must be securely mounted within an MSHA-certified explosion-proof enclosure or within a suitable enclosure located in the area of a mine that does not require permissible electrical equipment (i.e., fresh air intake airways).

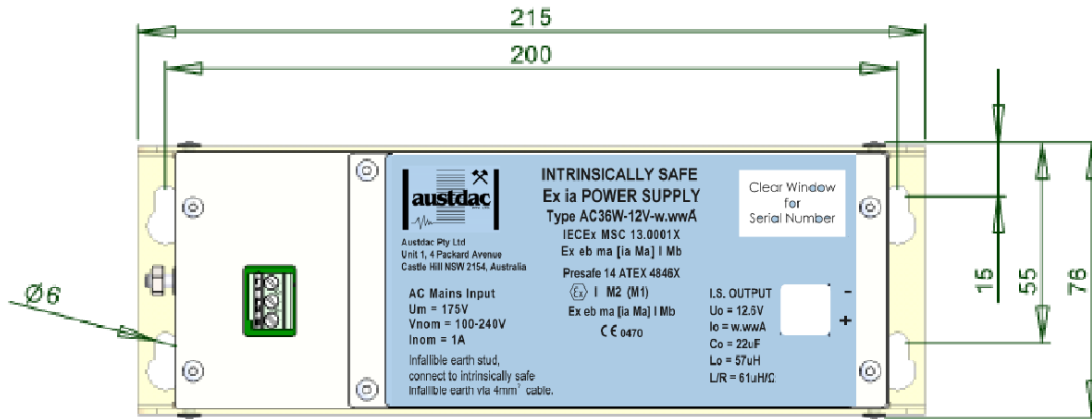
The maximum unprotected load that can be connected to the output of the power supply is 16uF and 55uH.

The thermal evaluation on devices that may be connected to the power supply is 12.6V and the spark ignition evaluation voltage is 13.7V (based on the maximum transient voltage).

The power supply must be securely connected to ground via the ground terminal on the power supply.

5 PHYSICAL DESCRIPTION

The AC36W is housed within a brass enclosure measuring approximately 95mm (120mm including terminals) H x 76mm D x 215mm W.



(AC36W 12.6V Version shown)

6 INPUT SUPPLY CONSIDERATIONS

It is important to confirm that the supply input voltage is greater than the minimum input voltage of 100V.

6.1 REFLECTED NOISE

If the AC36W is connected to a load that can produce voltage spikes that exceed the maximum output voltage of the AC36W, then the AC36W will react by firing its voltage crowbar circuits and shut down.

This is required as part of certification. Every effort has been taken to filter out any reflected load ripple or voltage spikes.

6.2 LOAD CURRENT SPIKES

Many loads do not draw a continuous or constant current. These changes in current may not be apparent or visible on an I.S. current meter. The spikes **MUST** be taken into account when calculating maximum load current. If the maximum output current of the AC36W is exceeded, then the AC36W will respond by limiting its output voltage to a safe value.

This limiting of the output voltage in response to load current surges may appear to the casual observer as output noise or ripple of the AC36W.

This limiting of output voltage in response to current surges above the AC36W maximum is a requirement of the I.S. explosion protection standards.

Therefore, if it is intended to operate the AC36W at or near its maximum output current it would be wise to check for high frequency load current spikes or surges.

6.3 INPUT/OUTPUT TERMINATIONS

For the AC36W and AC36W-W the mains input is provided via a three pin screw Ex e terminal. The mains input lines are shown on the label.

For the AC36W-C the mains input is via the integral cable.

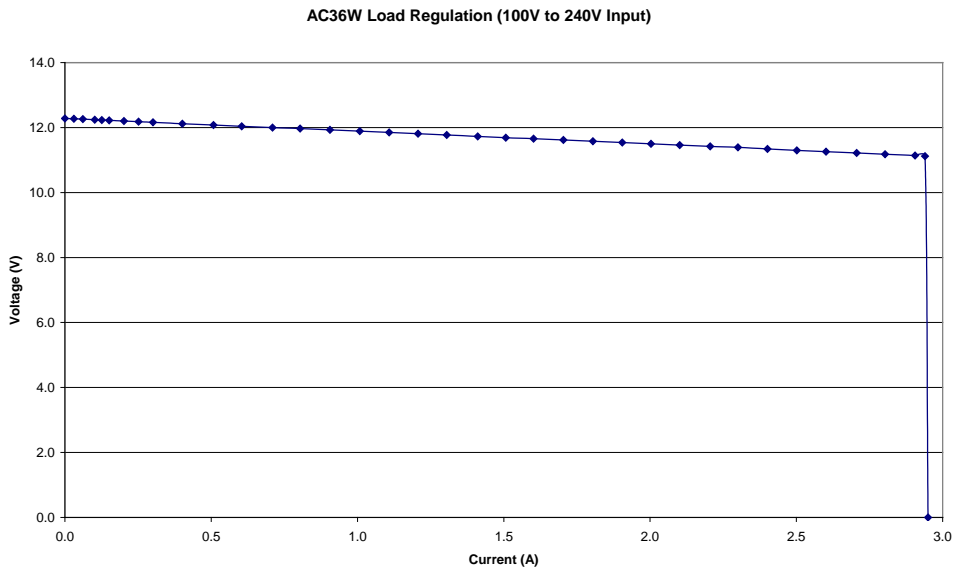
Note that the earth stud connection is also provided.

The I.S. output is provided via a two pin screw terminal. The I.S. DC output connector is wired as follows:-

| | |
|-------|------|
| PIN1 | + VE |
| PIN 2 | - VE |

6.4 LOAD REGULATION

The AC36W typical load regulation for the 12V 3A version is shown below;




7 CERTIFICATION

The AC36W has the following certification;

7.1 IECEX

Certificate No: IECEx MSC 13.0001X
 Marking Group I: Ex eb ma [ia Ma] I Mb
 Marking Group IIB: Ex eb ma [ia Ga] IIB Gb T4
 Port Parameters: Refer to Certificate
 Conditions of Use: Refer to Certificate

7.2 ATEX

Certificate No: Presafe 14 ATEX 4846X
 Marking:  I M2 (M1) Ex eb ma [ia Ma] I Mb
 Port Parameters: Refer to Certificate
 Conditions of Use: Refer to Certificate

7.3 MSHA

Intrinsic Safety Evaluation No. 18-ISA170002-0
 Port Parameters: Refer to Certificate
 Conditions of Use: Refer to Certificate

8 SPECIFICATIONS

| | |
|---------------------------------------|--|
| Input voltage (Nominal) | AC36W 100V to 175V (Ex e) or 100V to 250V as per Label. (Safe area) AC36W-W and AC36W-C 100V to 250V |
| Input current (Nominal) | 1A |
| Input Fuse Rating | 2A |
| Output voltage | 12V and 16V |
| Output current (12.6V Type Group I) | 0.1A to 3.3A |
| Output current (12.6V Type Group IIB) | 0.1A to 1.5A |
| Output current (16V Type Group I) | 0.1A to 1.0A |
| Size | 95mm (120mm including terminals) H x 76mm D x 215mm W |
| Mass | 3.2kg |
| Operating Temperature | -20 to 40 deg C |

9 GENERAL MOUNTING ARRANGEMENT

