



# IECEX Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit [www.iecex.com](http://www.iecex.com)

Certificate No.: IECEx MSC 13.0001X Issue No: 3 Certificate history:  
Status: **Current** Issue No. 3 (2017-09-25)  
Date of Issue: **2017-09-25** Page 1 of 5 Issue No. 2 (2014-07-29)  
Applicant: **Austdac Pty Ltd** Issue No. 1 (2014-04-08)  
Unit 1/ 42 Carrington Road, Issue No. 0 (2013-11-05)  
Castle Hill NSW 2154 Australia  
**Australia**

Equipment: **Intrinsically Safe Ex ia Power Supply Types AC36W-xxV-y.yyA, AC36W-W-xxV-y.yyA,  
AC36W-C-xxV-y.yyA, AC36W-W2-xxV-y.yyA and AC36W-C2-xxV-y.yyA**

*Optional accessory:*

Type of Protection: **Increased Safety, Encapsulation and Intrinsic Safety**

Marking:  
Ex eb ma [ia Ma] I Mb  
Ex ma [ia Ma] I Mb  
Ex eb ma [ia Ga] IIB Gb T4  
Ex ma [ia Ga] IIB Gb T4

Approved for issue on behalf of the IECEx  
Certification Body:

Geoff Slater

Position:

MSTC Manager

Signature:  
(for printed version)

Date:

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the [Official IECEx Website](http://www.iecex.com).

Certificate issued by:

**MSTC Mine Safety Technology Centre**  
8 Hartley Drive  
Thornton NSW 2322  
PO Box 343  
Hunter Region Mail Centre NSW 2310  
Australia



**Planning &  
Environment**  
Resources Regulator



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Manufacturer: **Austdac Pty Ltd**  
Unit 1/ 42 Carrington Road,  
Castle Hill NSW 2154 Australia  
**Australia**

Additional Manufacturing location(s):  
**Dongguan Hubbell Electrical Products Company Limited (DGHAL)**  
Xincheng Industrial Zone  
Hengli Town, Dongguan City  
523460, Guangdong  
China

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

#### STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

<b>IEC 60079-0 : 2011</b> Edition:6.0	Explosive atmospheres - Part 0: General requirements
<b>IEC 60079-11 : 2011</b> Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
<b>IEC 60079-18 : 2009</b> Edition:3	Explosive atmospheres Part 18: Equipment protection by encapsulation "m"
<b>IEC 60079-7 : 2006-07</b> Edition:4	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

#### TEST & ASSESSMENT REPORTS:

*A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in*

#### Test Report:

<a href="#">AU/MSC/ExTR13.0001/00</a>	<a href="#">AU/MSC/ExTR13.0001/01</a>	<a href="#">AU/MSC/ExTR13.0001/02</a>
<a href="#">AU/MSC/ExTR13.0001/03</a>	<a href="#">AU/TSA/ExTR12.0057/00</a>	

#### Quality Assessment Report:

<a href="#">AU/ITA/QAR06.0001/08</a>	<a href="#">AU/ITA/QAR15.0002/02</a>
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## Schedule

### EQUIPMENT:

*Equipment and systems covered by this certificate are as follows:*

The Intrinsically Safe Ex ia Power Supply Type AC36W which comes in three mains power versions for Group I applications and two versions for Group II application. This versions can be coded as AC36W-t-vvV-c.ccA where t = mains termination type (blank = Phoenix, W = Wago (Group I), C = Cable (Group I), W2 = Wago (Group II), C2 = Cable (Group II)), vv = voltage (12 or 16V) and c.cc = current (x.xx, y.yy, w.ww, z.zz)

The 16V or 12V power supplies deliver a maximum output voltage of 16.0 V or 12.6 V respectively and the Group I (x.xx, y.yy, w.ww and z.zz) depict the 0.10 A to 1.00 A, 1.05 A to 3.30 A, 0.10 A to 0.50 A and 0.55 A to 1.0 A current ranges incremented in steps of 0.05 A. Group II z.zzzA represent the unique current range of 0.10 A to 1.50 A incremented in steps of 0.05 A.

The mains switcher board (PCB0288A) and the i.s. output board (PCB0289A) are mounted parallel to each other and the terminal board (PCB0291A) is mounted on the top and at right angle to both boards with the assembly housed inside a 215 mm x 76 mm x 97 mm brass or stainless steel enclosure. All boards and components are fully encapsulated within the enclosure, except the output and Phoenix terminal blocks which are only partially encapsulated or the WAGO terminal block which is entirely un-encapsulated.

The Group I AC36W power supplies are distinguished by their means of mains supply connection facility, Maximum Output Voltage, Maximum Output Current and protection marking as follows:

Power Supply Type	Mains supply connection facility	Marking
AC36W-vvV-c.ccA	Phoenix Terminal Block	Ex eb ma [ia Ma] I
AC36W-W-vvV-c.ccA	WAGO Terminal Block	Ex eb ma [ia Ma] I
AC36W-C-vvV-c.ccA	Integral Cable	Ex ma [ia Ma] I

The Group IIB AC36W power supplies and have a maximum output voltage of 12.6 V and a maximum output current range of 0.10 A to 1.50 A incremented in steps of 0.05 A and are distinguished by their means of mains supply connection facility, Maximum Output Current and protection marking as follows:

Power Supply Type	Mains supply connection facility	Marking
AC36W-W2-12V-c.ccA	WAGO Terminal Block	Ex eb ma [ia Ga] IIB Gb T4
AC36W-C2-12V-c.ccA	Integral Cable	Ex ma [ia Ga] IIB Gb T4

### SPECIFIC CONDITIONS OF USE: YES as shown below:

Refer to the attached Annex for the conditions of certification.



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## DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

- Addition of an extra triplicated overcurrent protection monitoring and control circuit to reduce the response time (taken to shunt the output). All of the components within this circuit are considered as safety components.
- Addition of D313, D314, D315, D316, D317 and D318 for further output smoothing during operation of protection circuits.
- Increase to the capacitor values of C302, C305, C306, C310, C313, C314, C318, C321 and C322 to increase the output noise immunity.
- Decrease to the resistance values of R303, R319 and R339 from 3.3 k $\Omega$  to 1.2 k $\Omega$  to make the response faster.
- Change to the RC network previously consisting of the parallel R354, R362 and R363 resistors and the series C324, C328 and C329 to three separate networks consisting of R354 and the parallel C324 and C328; R362 and the parallel C329 and C330 and R363 and the parallel C331 and C322. This change is to make the sensing and filtering action of the RC network independent for each of the triplicated circuits.
- Change to inductor L100 from 200  $\mu$ H to 136  $\mu$ H
- Replacement of protection diodes across inductor L1 from STTH5L06B-TR to PMEG4050EP.
- Increase to the current output range of the AC36W-12V-x.xxA, AC36W-W-12V-x.xxA and AC36W-C-12V-x.xxA Power supplies from 1.05 A to 3.0 A to 1.05 A to 3.3 A.
- Adding a note to enclosure end plate 1 for MSHA approval purpose
- Addition of the AC36W power supply for Group IIB applications, having an output current range of 0.1 A to 1.5 A.
- Increase Um from 250 Vrms to 265 Vrms with fuses F100 and F101 changed to BK1-S505H-2-R that is 600VAC and 1500 A rated.
- Update of drawing 66-190-15 from revision 2 to revision 3 to illustrate the final assembly in its Phoenix, Wago and Cable versions. This revision change does not affect earlier assessments.
- Update of drawing 66-191-06 from issue 2 to issue 4 adding folds to the terminal plate lengths for better strength and increase slightly the grommet fitted hole through which pass the mains connections from the wago terminals to the power supply. This revision change does not affect earlier assessments.
- Inclusion of alternative engraved metallic label plate markings for the Wago and Cable versions.
- Change of the F201 and F202 to have a 100 mA, 660V and 100kA ratings for the purpose of increasing  $U_m$  and replacement of the 20 V D205-D207 zeners by D205-D207 in series with D219-D221 10 V zeners. This change does not adversely affect the original assessment.
- Removal of components L200 & C204. This change does not adversely affect the original assessment.
- Change of applicant and manufacturer address to Unit 1/ 42 Carrington Road, Castle Hill NSW 2154 Australia.
- Addition of the Dongguan Hubbell Electrical Products Company Limited (DGHAL) manufacturing site at Xincheng Industrial Zone Hengli Town, Dongguan City 523460, Guangdong, China.



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**Additional information:**

Refer to the attached Annex for additional information

**Annex:**

[Annex of IECEx MSC13.0001\\_3.pdf](#)



# IECEx Certificate of Conformity Annex

Annex for Certificate No.: IECEx MSC 13.0001X Issue No: 3

## Conditions of certification pertaining to Issue 3 of this Certificate:

### Condition of manufacture:

It is a condition of manufacture that the T200 infallible transformer shall be subject to the routine test in accordance with Clause 11.2 of IEC60079-11:2011.

### Special conditions of safe use:

It is a condition of safe use that and

1. the following parameters are taken into account during any installation::

### Power Supply Type AC36W-xxV-y.yyA for Group I:

Um = 175 VRMS (Phoenix Mains Terminal Block)

Variation	U <sub>o</sub>	I <sub>o</sub>	P <sub>o</sub>	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
AC36W-12V-w.wwA	12.6 V	0.1 A to 1.0 A	U <sub>o</sub> x I <sub>o</sub>	22 µF	57 µH	61 µH/Ω
AC36W-12V-x.xxA	12.6 V	1.05 A to 3.30 A	U <sub>o</sub> x I <sub>o</sub>	18 µF	55 µH	22 µH/Ω
AC36W-16V-y.yyA	16.0 V	0.1 A to 0.5 A	U <sub>o</sub> x I <sub>o</sub>	11.5 µF	41 µH	53 µH/Ω
AC36W-16V-z.zzA	16.0 V	0.55 A to 1.0 A	U <sub>o</sub> x I <sub>o</sub>	6 µF	33 µH	29 µH/Ω

### Power Supply Types AC36W-W-xxV-y.yyA & AC36W-C-xxV-y.yyA for Group I:

Um = 265 VRMS

Variation	U <sub>o</sub>	I <sub>o</sub>	P <sub>o</sub>	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
AC36W-t-12V-w.wwA	12.6 V	0.1 A to 1.0 A	U <sub>o</sub> x I <sub>o</sub>	22 µF	57 µH	61 µH/Ω
AC36W-t-12V-x.xxA	12.6 V	1.05 A to 3.30 A	U <sub>o</sub> x I <sub>o</sub>	18 µF	55 µH	22 µH/Ω
AC36W-t-16V-y.yyA	16.0 V	0.1 A to 0.5 A	U <sub>o</sub> x I <sub>o</sub>	11.5 µF	41 µH	53 µH/Ω
AC36W-t-16V-z.zzA	16.0 V	0.55 A to 1.0 A	U <sub>o</sub> x I <sub>o</sub>	6 µF	33 µH	29 µH/Ω

### Power Supply Type AC36W-W2-12V-z.zzA & AC36W-C2-12V-z.zzA for Group IIB:

Um = 265 VRMS

Variation	U <sub>o</sub>	I <sub>o</sub>	P <sub>o</sub>	C <sub>o</sub>	L <sub>o</sub>	L <sub>o</sub> /R <sub>o</sub>
AC36W-t-12V-z.zzA	12.6 V	0.1 A to 1.50 A	U <sub>o</sub> x I <sub>o</sub>	6.65 µF	54 µH	41 µH/Ω

2. The AC36W power supplies fitted with the Phoenix or WAGO terminal blocks for mains must be housed in a suitable enclosure that provides a minimum degree of ingress protection of IP54 and adequate protection from impact to the Ex e certified component (terminal block) when installed in a safe area.
3. The AC36W power supplies fitted with the Phoenix or WAGO terminal blocks must be housed in a suitably certified enclosure that provides a minimum degree of ingress protection of IP54 and adequate protection from impact to the Ex e certified component (terminal block) when installed in a hazardous area.
4. The AC36W power supplies fitted with integral cable must have the mains supply wires suitably terminated in a suitably certified enclosure and the cable protected from damage when installed in the hazardous area.

Certificate issued by:



## IECEX Certificate of Conformity Annex

**Annex for Certificate No.: IECEx MSC 13.0001X**

**Issue No: 3**

**Drawing list pertaining to Issue 3 of this Certificate:**

Drawing/Document Number:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
61-316-04	1	Inductor_Power_136μHG with Infallible_insulation	02	2016/07/15
66-170-03	1 of 3	INTRINSICALLY SAFE Ex ia POWER SUPPLY TYPE AC36W PCB0291A SCHEMATIC DIAGRAM	14	2017/01/09
66-170-03	2 of 3	INTRINSICALLY SAFE Ex ia POWER SUPPLY TYPE AC36W PCB0288A SCHEMATIC DIAGRAM	14	2017/01/09
66-170-03	3 of 3	INTRINSICALLY SAFE Ex ia POWER SUPPLY TYPE AC36W PCB0289A SCHEMATIC DIAGRAM	14	2017/01/09
66-171-21	7	Intrinsically safe Ex ia Power Supply Type AC36W PCB0288A Artwork Details	03	2017/01/09
66-172-21	7	Intrinsically safe Ex ia Power Supply Type AC36W PCB0289A Artwork Details	10	2016/09/21
66-174-21	7	Intrinsically safe Ex ia Power Supply Type AC36W PCB0291A Artwork Details	05	2016/11/30
66-177-06	3	Intrinsically safe Ex ia Power Supply Chassis Type AC36W Mechanical Details	03	2016/03/31
66-182-24	1	Intrinsically safe Ex ia Power Supply Type AC36W 12.6V Transformer Certification Details	04	2017/02/01
66-186-04	2	Intrinsically safe Ex ia Power Supply Type AC36W Assembly Diagram	03	2015/11/16
66-190-15	1	Intrinsically safe Ex ia Power Supply Type AC36W General Arrangement	03	2014.10.22
66-191-06	1	Intrinsically safe Ex ia Power Supply Type AC36W Terminal Plate Mechanical Details	04	2015.04.24
66-258-13	2	Intrinsically safe Ex ia Power Supply Type AC36W-W Wago Version Um = 265V Label Details	02	2017/09/05
66-259-13	2	Intrinsically safe Ex ia Power Supply Type AC36W-C Cable Version Um = 265V Label Details	02	2017/09/20

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	<b>Planning &amp; Environment</b> Resources Regulator	<h3>Mine Safety Technology Centre</h3>
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Annex for Certificate No.: IECEx MSC 13.0001X

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Drawing/Document Number:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
66-264-14	9	Intrinsically safe Ex ia Power Supply Variant IECEx Type AC36W-Output Voltage-Current Variants & final Assembly Parts list.	01	2017.08.16
66-270-14	2	Intrinsically safe Ex ia Power Supply Type AC36W-PCB0291A Bill Of Materials	01	2017/03/09
66-271-14	2	Intrinsically safe Ex ia Power Supply Type AC36W-PCB0288A Bill Of Materials	01	2017/03/09
66-272-14	2	Intrinsically safe Ex ia Power Supply Type AC36W-PCB0289A Bill Of Materials	01	2017/03/09
66-275-06	1	Intrinsically safe Ex ia Power Supply Type AC36W Group IIB Label Plate Mechanical Details	01	2017/09/20

Certificate issued by:

 <b>NSW</b> GOVERNMENT	<b>Planning &amp; Environment</b> Resources Regulator	<b>Mine Safety Technology Centre</b>
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