

# **Anti-reverse Protection Unit IT-E165A User Manual**

## Notices

© Itech Electronic, Co., Ltd. 2024  
No part of this manual may be reproduced in any form or by any means (including electronic storage and retrieval or translation into a foreign language) without prior permission and written consent from Itech Electronic, Co., Ltd. as governed by international copyright laws.

### Manual Part Number

IT-E165A

### Revision

2nd Edition: May 13th, 2024  
Itech Electronic, Co., Ltd.

### Trademarks

Pentium is U.S. registered trademarks of Intel Corporation.

Microsoft, Visual Studio, Windows and MS Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries and regions.

## Warranty

The materials contained in this document are provided “as is”, and is subject to change, without prior notice, in future editions. Further, to the maximum extent permitted by applicable laws, ITECH disclaims all warranties, either express or implied, with regard to this manual and any information contained herein, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. ITECH shall not be held liable for errors or for incidental or indirect damages in connection with the furnishing, use or application of this document or of any information contained herein. Should ITECH and the user enter into a separate written agreement with warranty terms covering the materials in this document that conflict with these terms, the warranty terms in the separate agreement shall prevail.

### Technology Licenses

The hardware and/or software described herein are furnished under a license and may be used or copied only in accordance with the terms of such license.

### Restricted Rights Legend

Restricted permissions of the U.S. government. Permissions for software and technical data which are authorized to the U.S. Government only include those for custom provision to end users. ITECH provides this customary commercial license in software and technical data pursuant to FAR 12.211 (Technical Data) and 12.212 (Computer Software) and, for the Department of Defense, DFARS 252.227-7015 (Technical Data – Commercial Items) and DFARS 227.7202-3 (Rights in Commercial Computer Software or Computer Software Documentation).

## Safety Notices

### CAUTION

A CAUTION sign denotes a hazard. It calls attention to an operating procedure or practice that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION sign until the indicated conditions are fully understood and met.

### WARNING

A WARNING sign denotes a hazard. It calls attention to an operating procedure or practice that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING sign until the indicated conditions are fully understood and met.



### NOTE

A NOTE sign denotes important hint. It calls attention to tips or supplementary information that is essential for users to refer to.

## Quality Certification and Assurance

We certify that instrument meets all the published specifications at time of shipment from the factory.

## Warranty

ITECH warrants that the product will be free from defects in material and workmanship under normal use for a period of one (1) year from the date of delivery (except those described in the Limitation of Warranty below).

For warranty service or repair, the product must be returned to a service center designated by ITECH.



### Note

Visit <https://www.itechate.com/en/support/register.html> to complete product registration by filling out the necessary information to extend the warranty to two (2) years.











- The product returned to ITECH for warranty service must be shipped PREPAID. And ITECH will pay for return of the product to customer.
- If the product is returned to ITECH for warranty service from overseas, all the freights, duties and other taxes shall be on the account of customer.




## Limitation of Warranty

This Warranty will be rendered invalid if the product is:





- Damaged resulting from customer-wired circuits or customer-supplied parts or accessories;
- Modified or repaired by customer without authorization;
- Damaged resulting from customer-wired circuits or use in an environment not designated by us;
- The product model or serial number is altered, deleted, removed or made illegible by customer;
- Damaged as a result of accidents, including but not limited to lightning, moisture, fire, improper use or negligence.

## Safety Symbols

	Direct current		ON ( power)
	Alternating current		OFF ( power)
	Both direct and alternating current		Power-on state
	Chassis (earth ground) symbol.		Power-off state
	Earth ( ground) terminal		Reference terminal

	Caution	+	Positive terminal
	Warning ( refer to this manual for specific Warning or Caution information)	—	Negative terminal
	A chassis terminal	-	-

## Regulatory Markings

	The CE tag shows that the product complies with the provisions of all relevant European laws (if the year is shown, it indicates that the year when the design is approved).
	The UKCA tag shows that the product complies with the provisions of all relevant United Kingdom laws (if the year is shown, it indicates that the year when the design is approved).
	This instrument complies with the WEEE directive (2002/96/EC) tag requirements. This attached product tag shows that the electrical/electronic product cannot be discarded in household waste.
	This symbol indicates that no danger will happen or toxic substances will not leak or cause damage in normal use within the specified period. The service life of the product is 10 years. The product can be used safely within the environmental protection period; otherwise, the product should be put into the recycling system.

## Waste Electrical and Electronic Equipment (WEEE) Directive



2002/96/EC Waste Electrical and Electronic Equipment ( WEEE) Directive

This product complies with the WEEE Directive ( 2002/96/EC) marking requirement. This affix product label indicates that you must not discard the electrical/electronic product in domestic household waste.

Product Category

With reference to the equipment classifications described in the Annex 1 of the WEEE Directive, this instrument is classified as

a “Monitoring and Control Instrument”.  
To return this unwanted instrument, contact your nearest  
ITECH office.

## Compliance Information

Complies with the essential requirements of the following applicable European Directives, and carries the CE marking accordingly:

- Electromagnetic Compatibility (EMC) Directive 2014/30/EU
- Low-Voltage Directive (Safety) 2014/35/EU

Conforms with the following product standards:

### EMC Standard

IEC 61326-1:2012/ EN 61326-1:2013 <sup>123</sup>

#### Reference Standards

CISPR 11:2015+A1:2016 Ed 6.1

IEC 61000-3-2: 2018 RLV

IEC 61000-3-3: 2013+A1:2017

IEC 61000-4-2:2008

IEC 61000-4-3 2006+A1:2007+A2:2010/ EN 61000-4-3 A1:2008+A2:2010

IEC 61000-4-4:2012

IEC 61000-4-5:2014+A1:2017

IEC 61000-4-6:2013+cor1:2015

IEC 61000-4-11:2004+A1:2017

1. The product is intended for use in non-residential/non-domestic environments. Use of the product in residential/domestic environments may cause electromagnetic interference.
2. Connection of the instrument to a test object may produce radiations beyond the specified limit.
3. Use high-performance shielded interface cable to ensure conformity with the EMC standards listed above.

### Safety Standard

IEC 61010-1:2010+A1:2016

## Content

Quality Certification and Assurance .....	i
<b>Warranty</b> .....	i
Limitation of Warranty .....	i
Safety Symbols .....	i
<b>Regulatory Markings</b> .....	ii
Waste Electrical and Electronic Equipment (WEEE) Directive .....	ii
<b>Compliance Information</b> .....	iv
<b>Chapter 1 IT-E165A Introduction</b> .....	<b>1</b>
1.1 Introduction .....	1
1.2 How to Use .....	4

# Chapter 1 IT-E165A Introduction

IT-E165A is an optional anti-reverse module we prepared for users, suitable for IT6000 series (including IT6000B, IT6000C, IT6000D, IT8000), IT-M3900 series (including IT-M3900B, IT-M3900C, IT-M3900D, IT-M3800) and IT6500C/D series.

It is necessary to consider that the voltage/current of the DUT is within the rated voltage/current range of IT-E165A.

The following models are available:

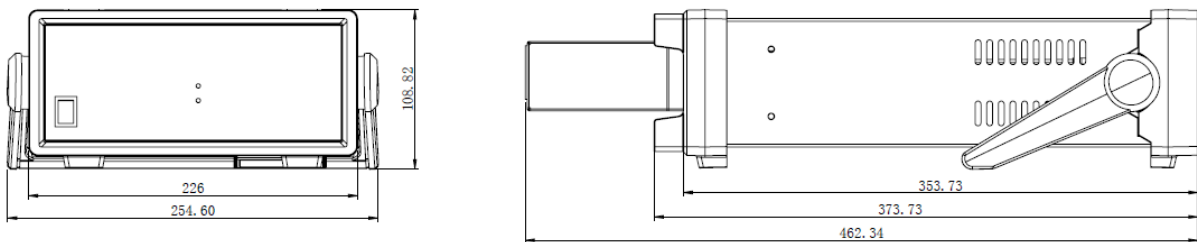
Model	Voltage	Current
IT-E165A-250	750V	250A
IT-E165A-400	750V	400A
IT-E165A-500	900V	400A
IT-E165A-750	1500V	750A
IT-E165A-1000	1500V	1000A

The main functions are as follows:

It can effectively avoid the reverse connection of the DUT. IT-E165A has a built-in detection circuit to detect the voltage difference to determine whether it is reversed. If it is reversed, the test circuit is disconnected to ensure the safety of the DUT and the operator.

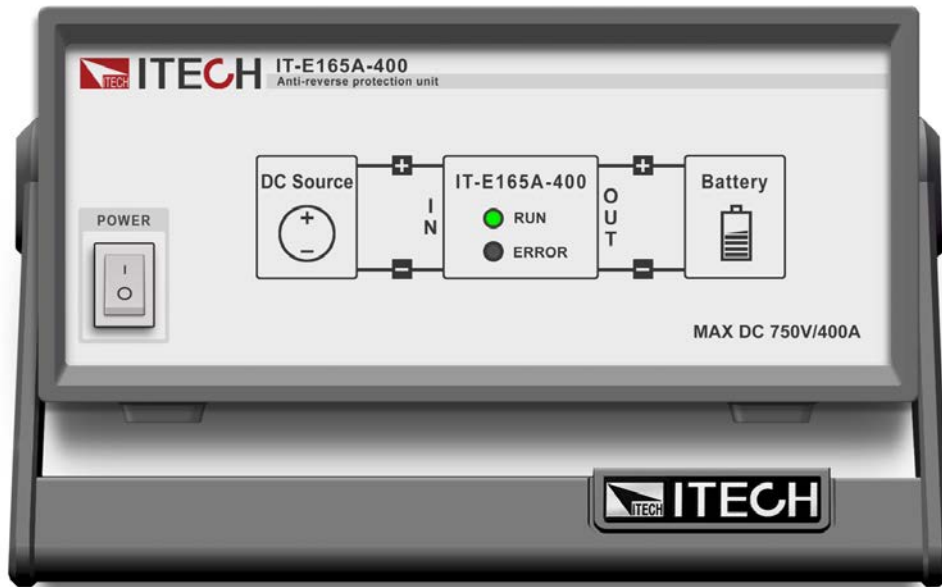
## 1.1 Introduction

- The dimensions of IT-E165A-250, IT-E165A-400, and IT-E165A-500 are shown below. Unit: mm



The front panel is shown below.

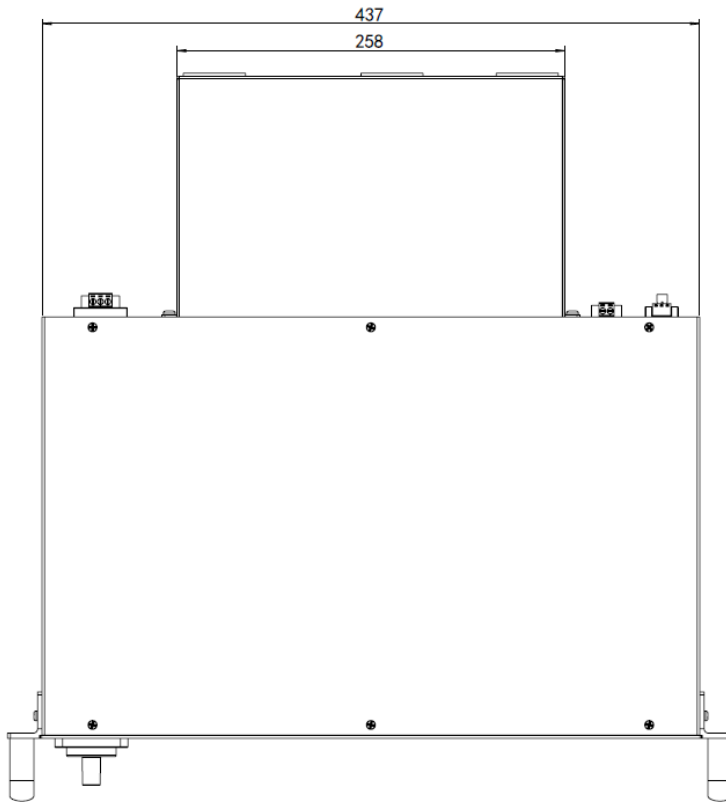
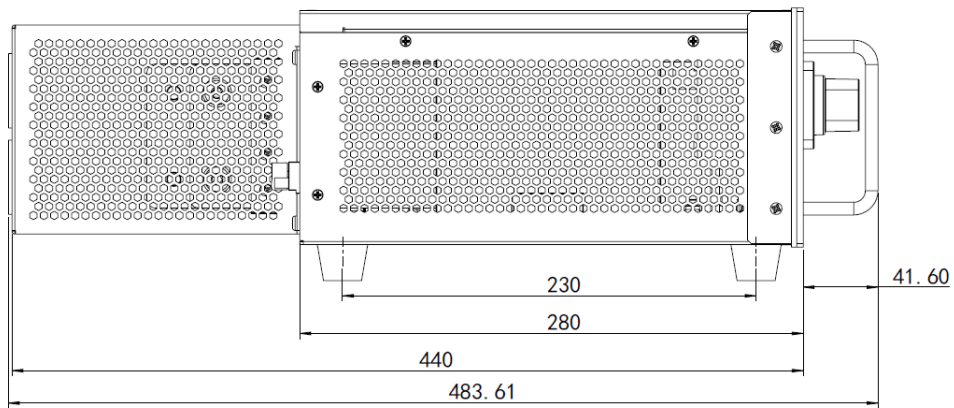
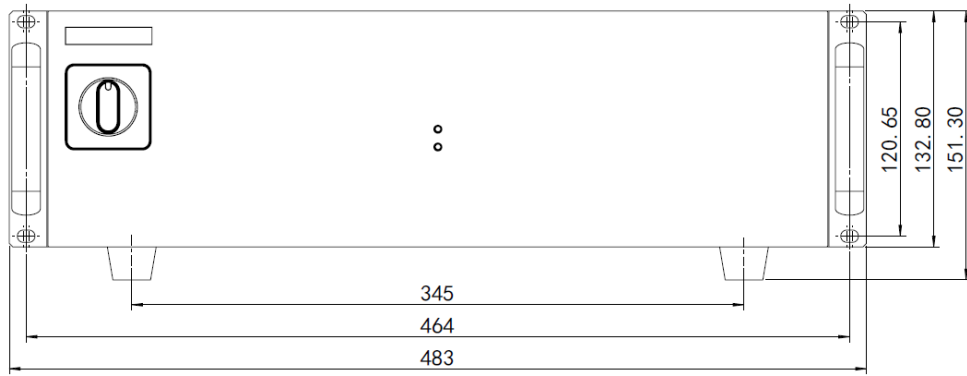




The rear panel is shown below.



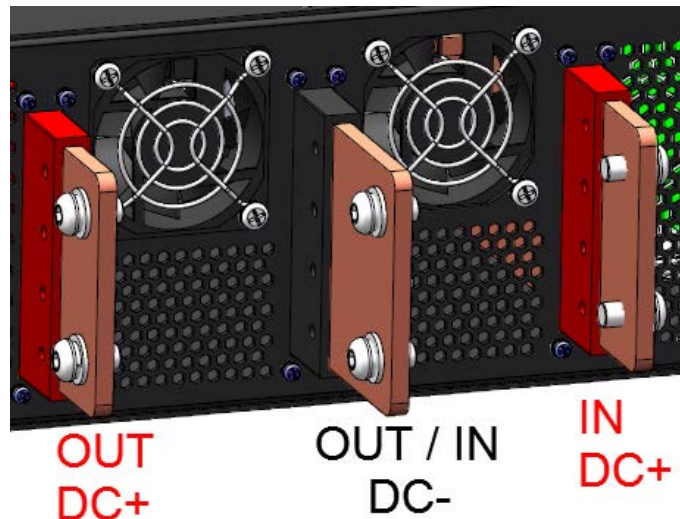
- AC input: 88~264VAC, 50/60Hz, 1.3A max.
  - DC terminals: OUT DC+ DC-; IN DC- DC+
  - Sense: reserved terminals, no connection required
  - IO: When leaving the factory, the pin IN is shorted to GND by default, and the instrument can work normally; if the short-circuit piece is removed, the instrument will not work. When the instrument is running, there is a low level of 0V between OUT and GND, and a high level of 5V in the non-RUN state.
- The dimensions of IT-E165A-750 and IT-E165A-1000 are as shown in the figure below.  
Unit: mm



The rear panel is shown below.



1. AC input terminals L, N, PE  
 AC input voltage range: 180~550VAC  
 AC input frequency range: 47~63Hz  
 AC input inrush current: 50A (cold start)
2. DC terminals



**Note:** The maximum current of the positive and negative terminals of IN and OUT on the rear panel is 1000A.

3. Normally open contact  
 5A at 250VAC, 24VDC
4. Digital IO terminals

When leaving the factory, the pin IN is shorted to GND by default, and the instrument can work normally; if the short-circuit piece is removed, the instrument will not work. When the instrument is running, there is a low level of 0V between OUT and GND, and a high level of 5V in the non-RUN state.

## 1.2 How to Use

1. Make sure that the power of the battery, IT-E165A, and IT6000 is turned off.

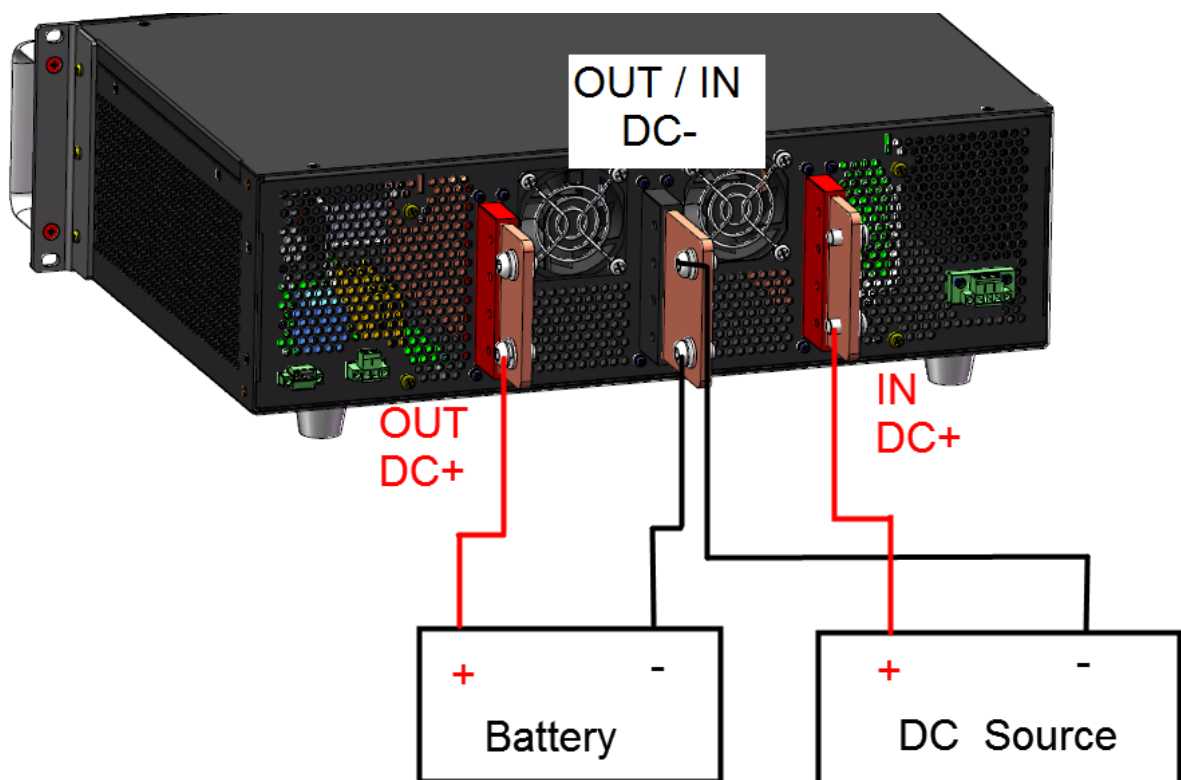
- Refer to the following diagram to connect the IT6000 series instrument and the DUT (battery).

- IT-E165A-250, IT-E165A-400, IT-E165A-500



Note: The green terminals Sense and IO on the rear panel are reserved terminals and do not need to be connected.

- IT-E165A-750, IT-E165A-1000



- Connect the power cord of IT-E165A.
- Start the battery and turn on the IT6000 power switch.
- Turn on the Power switch of the IT-E165A.

If IT6000 (IN) and DUT (OUT) are not reversed, and the voltage difference between IT6000 (IN) and DUT (OUT) is less than 3V, the indicator will display RUN (green light);

If there is a reverse connection between IT6000 (IN) and DUT (OUT), or the voltage difference between IT6000 (IN) and DUT (OUT) is greater than 3V, the indicator will display ERROR (red light). Please recheck whether

IT6000 (IN) and DUT (OUT) are reversely connected, and make sure that the voltage difference between IT6000 (IN) and DUT (OUT) is less than 3V.

## **Contact US**

Thank you for purchasing ITECH products. If you have any doubt about this product, please contact us as follows.

1. Visit ITECH website [www.itechate.com](http://www.itechate.com).
2. Select the most convenient contact for further consultation.