

Index :

- 1.1 – Warnings and safety precautions
- 1.2 – User Interface
- 1.3 **To Alter AC ramp speed**
- 1.4 **To Alter DC ramp speed**
- 1.5 **Buzzer ON/OFF**
- 1.6 **Date and time settings**
- 1.7 **Display Brightness – High / Low**
- 1.8 **Software Version and about information**

2.0 Testing the DUO ESD device.

2.1 Recognizing the DUO ESD

2.2 Basic functionality of how the DUO tester tests the DUO ESD:

2.3 ESD DUO testing connection diagram.

2.4 How to complete test 1 & test 2 for the DUO ESD.

3.0 Testing the DUO V4 Device

4.0 Testing the DUO V5 Device

5.0 Duo tester specifications and calibration

6.0 DUO ESD tester specifications

DUO Models and functions quick overview.

	a.c. Voltage sensing	DC voltage sensing	Trip method	Reset Button	Indicator light	Testing Method	Inbuilt function test circuit
DUO ESD	✓	✗	RCBO	✗	✗	Removal	✓
DUO V4&4A	✓	✓	Relay or contactor	✓	✓	Removal or insitu	✓
DUO V5 &V5A	✓	✓	Relay or contactor	✓	✓	Insitu	✓

Indicator Light shows green in normal operation - red when a fault exists, and red flashing indicates the fault has been removed and requires reset button to be reset. (Units can be programmed to start automatically on request)

DUO V4 & V5 supplies a 5 V DC signal out for control.

DUO V4A & V5A supplies a mains voltage out for control - Maximum 10 amps

Duo V4 & V4A can be tested in place with use of the original plugs supplied with the device (Earth sensor must be removed from connected equipment)


DUO V5 & V5A can be tested in place and has a switch that isolates the Earth sensor and voltage supply off the connected equipment during testing

DUO V5 & V5A have a separate lead for the tester connection.

The DUO tester has features for testing the DUO devices which includes the DUO ESD , the DUO 4 and the DUO 5.


1.1 Warnings and Safety Precautions:

In order to reach a high level of operator safety while carrying out various measurements using the instrument, as well as to keep the test equipment undamaged, it is necessary to consider the following general warnings:

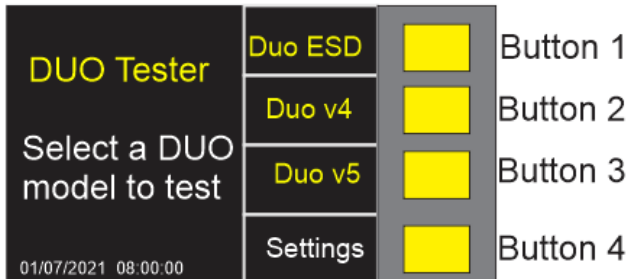
-  **This symbol requires an action!**
- Warning -Read the Instruction manual with special care to safety operation.
- Read this instruction manual carefully, otherwise use of the instrument may be dangerous for the operator, for the instrument or for the equipment under test
- If the test equipment is used in manner not specified in this instruction manual the protection provided by the equipment may be impaired
- | Do not use the instrument and accessories if any damage is noticed!
- Do not touch any test leads/terminals while the appliance is connected to the DUO TESTER
- Consider all generally known precautions in order to avoid risk of electric shock while dealing with hazardous voltages!
- The mains supply voltage has to be higher than 230 V a.c. otherwise the internal power supply could be damaged.
- Use only standard or optional test accessories, supplied by your distributor that are designed for use with these products
- Instrument servicing and adjustment have to be carried out by competent authorized personnel- Return to Powersafe Products for servicing
- Hazardous voltages can exist inside the instrument. Disconnect all test leads, remove the power supply cable and switch off the instrument before removing any equipment under test, leads or associated equipment during, prior or after testing
- The operator must be competent to in performing the test and have a clear understanding of the required testing operation and operation of the devices discussed here in.
- Never connect equipment to the DUO TESTER or any other apparatus that it is not designed for or described in this manual – Doing so may result in damage to the tester, personal or connected equipment – Only use the device as intended for.

Only qualified competent electricians and trained persons should operate the DUO tester and associated product. Do not operate the equipment without having a full understanding of this manual and ensuring correct safety procedures are in place prior to testing.

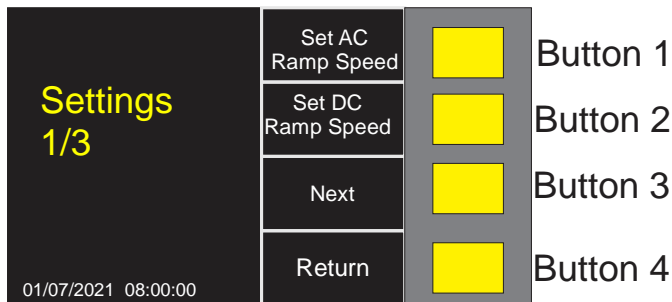
 **Danger the DUO tester delivers voltages that can cause electric shock, injury or death.**

 **Testing should only be carried out on a test bench with the appropriate safety equipment in place**

1.2 - User Interface:



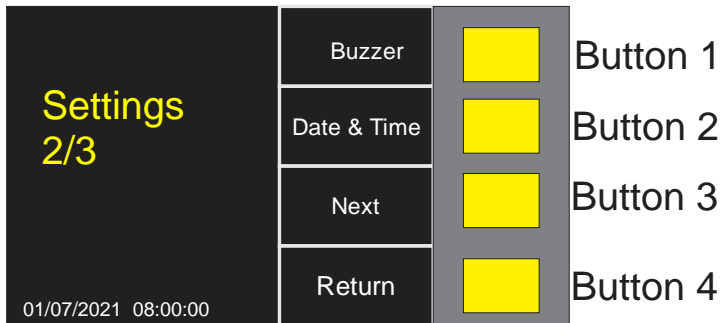
To enter main interface press “Settings” – Button 4



1.3 -To Alter AC ramp speed (Speed in which the AC voltage is ramped up during testing) can be altered by pressing “Set AC ramp Speed” – **Button 1** and following on the onscreen instructions – For general use recommended settings is 500mV/s

1.4- To Alter DC ramp speed (Speed in which the DC voltage is ramped up during testing) can be altered by pressing “Set DC ramp Speed” – **Button 2** and following on the onscreen instructions – For general use recommended settings is 500mV/s

Page 2 of Settings -Pressing “Next”- Button 3 on page 1 of Settings – will enter page 2 of the settings :

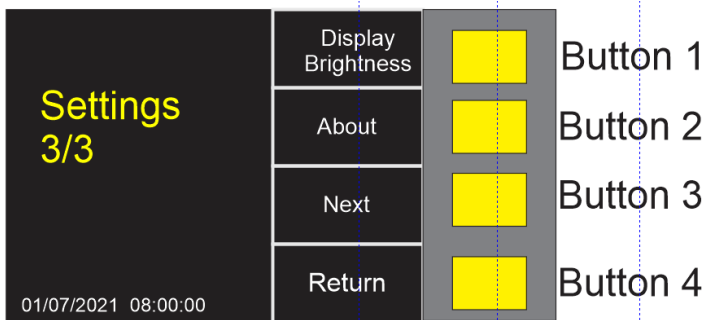


Page 2 allows for alterations to the Buzzer and Date & Time

1.5 Buzzer can be turned ON or OFF following On screen instructions

1.6 Date and time can be adjusted following on screen instructions.

Page 3 of Settings -Pressing “Next”- Button 3 on page 2 of Settings – will enter page 3 of the settings :



Page 3 allows for alterations to the Display Brightness and shows information including the software version.

1.7 Display Brightness can be turned High or Low following on screen instructions.

1.8 About Page displays information and **software version** following on screen instructions.

2.0 Testing the DUO ESD device :

2.1 Recognizing the DUO ESD :



DUO ESD is fitted with A RCBO.

The DUO tester does not test the RCBO side of the DUO ESD and purely tests the DUO ESD functionality- Voltage reference on the earth sensor to neutral. The RCD shall be tested in a separate test as required under local or national standards.

2.2 Basic functionality of how the DUO tester tests the DUO ESD:

DUO ESD TEST FUNCTIONS:

Test 1: The DUO tester applies voltage in 50Hz a.c. on the tester outlet point to the connected Earth sensor wire of the DUO ESD. This voltage starts at 30V a.c. and is slowly ramped up in voltage until the trip voltage is measured. The voltage output on the TEST point is limited to 50 V a.c. in the event the DUO ESD does not trip.

Test 2 : A voltage greater than the trip voltage is applied to the DUO ESD and the time taken for the device to trip is then measured and if this exceeds the specified trip time it fails the test.

2.3 – Connection Diagram for testing - Please ensure the device is connected as per the diagram below:



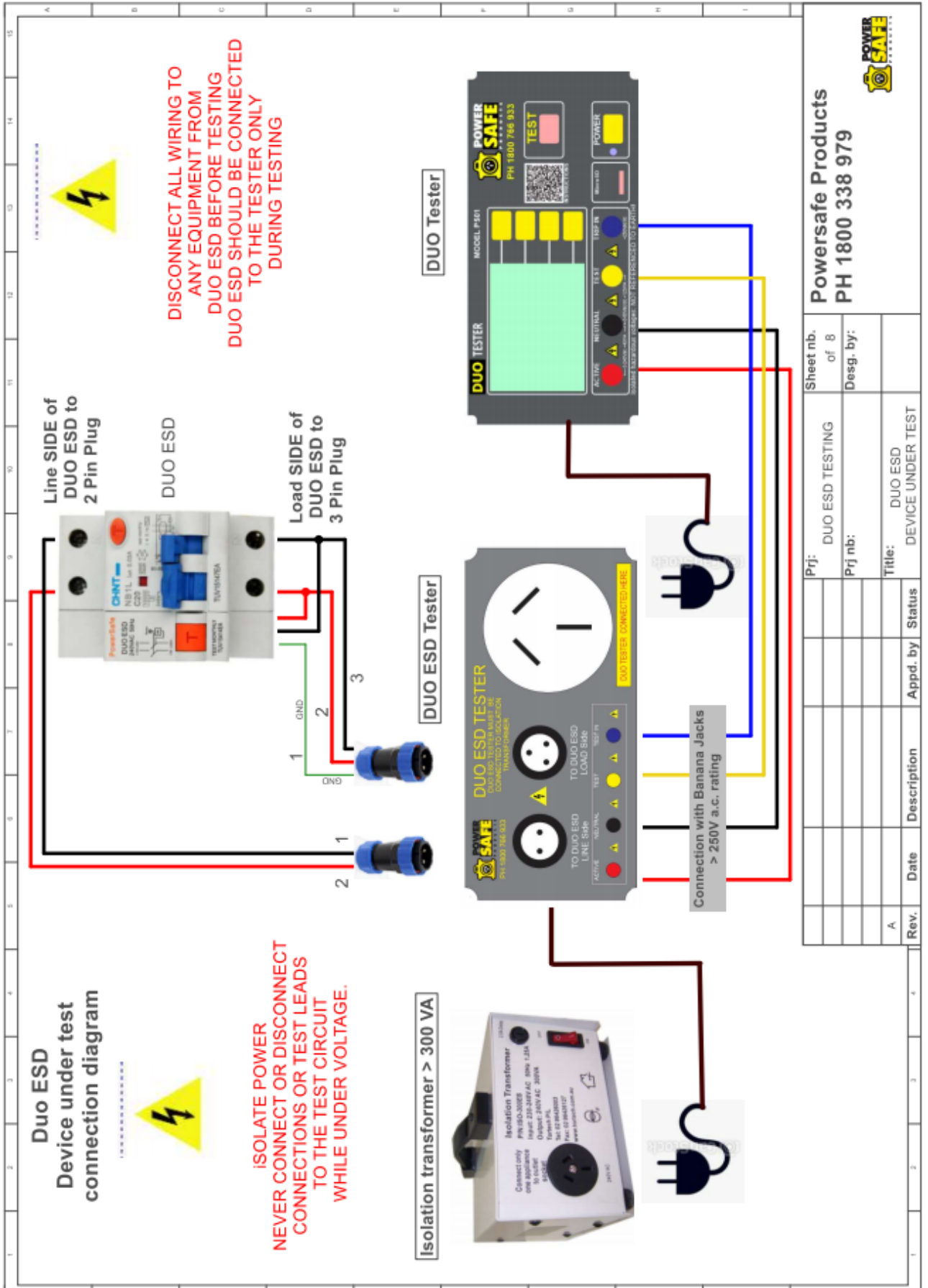
The DUO ESD shall be disconnected from any connected devices or equipment as this test will apply voltage to the earth sensor wire. Any connected equipment will also have voltage applied and this could cause damage to connected equipment – Always remove connected equipment prior to testing.

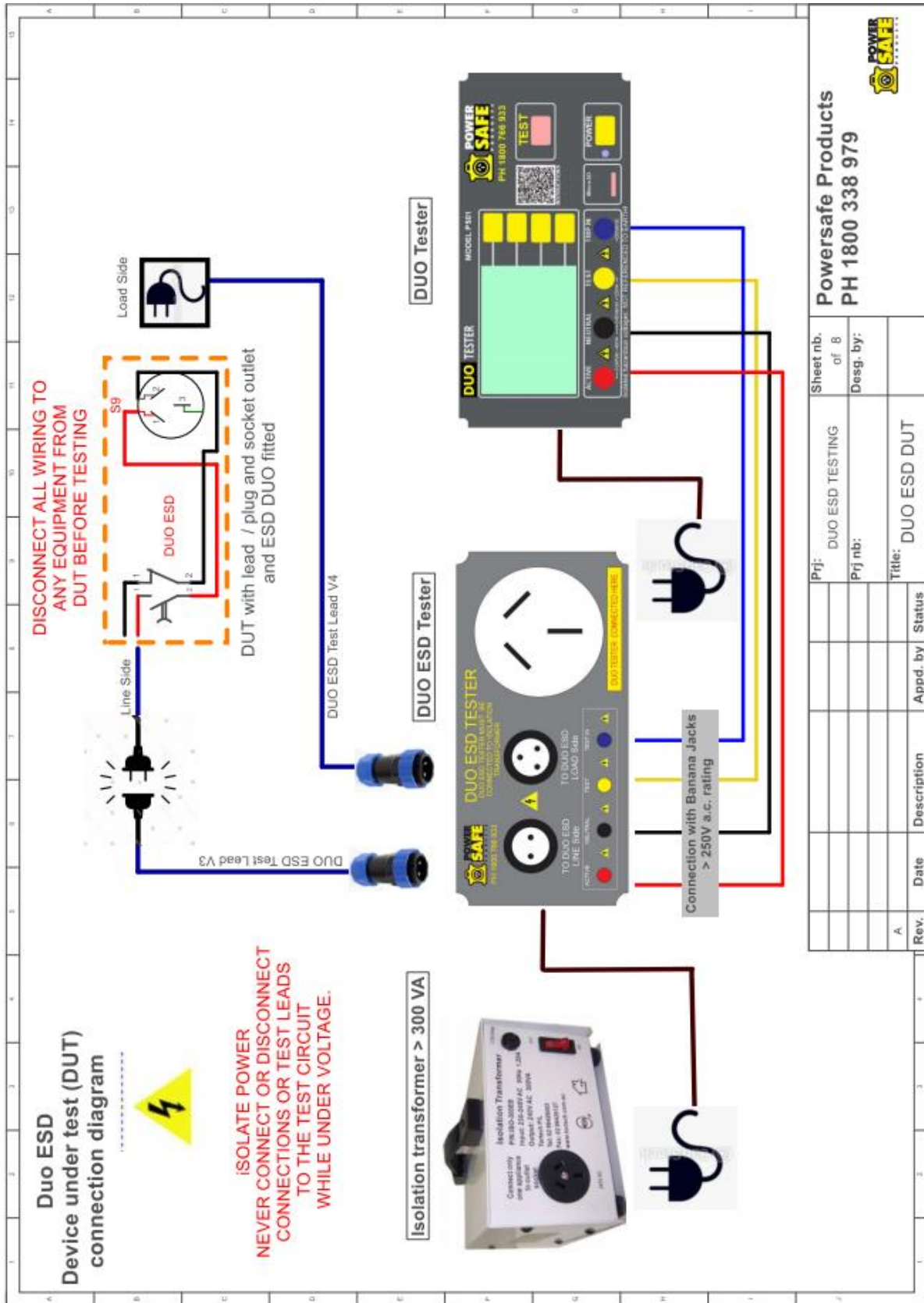


The DUO tester and associated equipment must only be connected as per these instructions and failure to ensure that it is properly connected may cause damage or the risk of electric shock



An isolation transformer **MUST** be used for testing of the DUO ESD





Sheet no. of 8
Prj: DUO ESD TESTING
Prj nb:
Title: DUO ESD DUT

Rev. Date Description Appd. by Status

Rev.	Date	Description	Appd. by	Status
A				

Powersafe Products
PH 1800 338 979

POWER SAFE

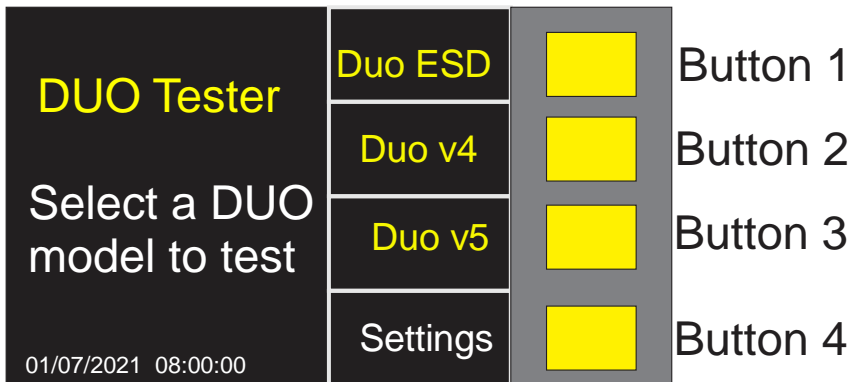
2.4 How to complete test 1 & test 2 for the DUO ESD.

The DUO tester is connected to a DUO ESD tester and an isolation transformer. A isolation transformer must be used for testing the DUO ESD.

The purpose of this is so that the DUO ESD will sink power from the isolation transformer for tripping the coil and also ensures that all earthing is isolated out for testing.

Test 1 for the DUO ESD :

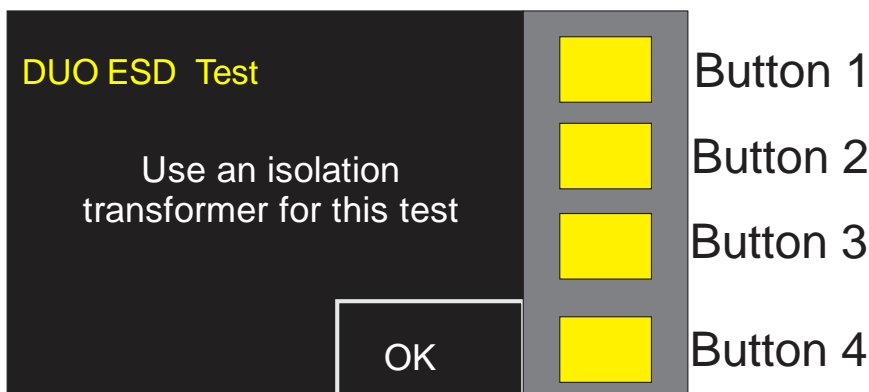
1. Press button 1 - “DUO ESD”



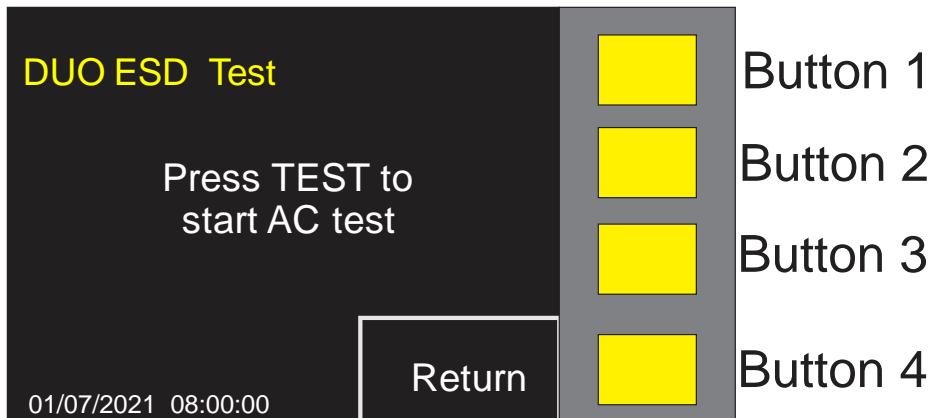
2. Press button 4 – “OK” once you have confirmed it is setup as per the diagram and a isolation transformer is used during testing.



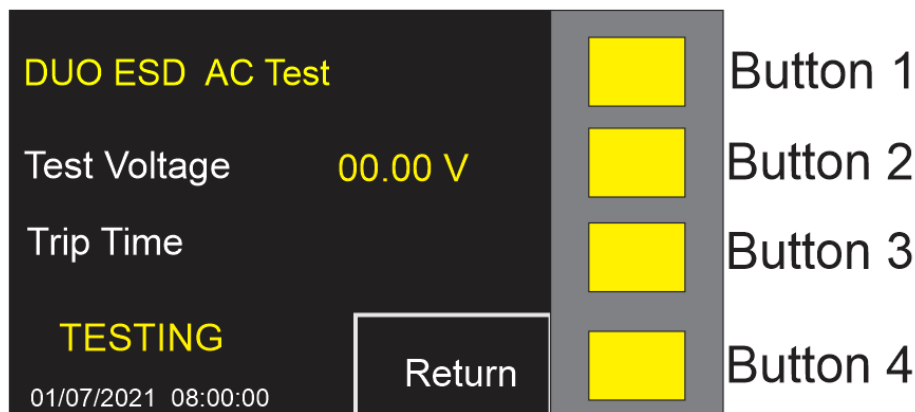
Failure to use a isolation transformer could result in damage to the DUO ESD.



3. Press button 5- – Ensure the DUO ESD is in normal operating mode (has not tripped) prior to pressing button 5 - “Test” button to start the test.
To abort the test press “Return” – Button 4



- The Duo Tester will apply 30 V a.c. to the test lead output and then start to ramp the voltage up – this voltage is shown on the display and can also be verified measuring voltage from neutral to test outlet jacks. For oscilloscope measurements / capture ensure that isolated high voltage probes are used only.

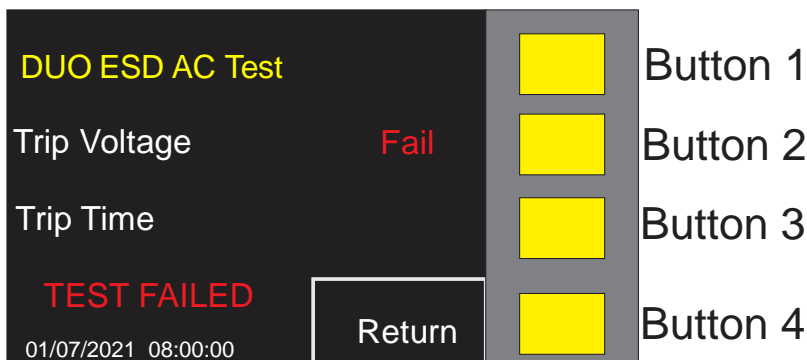


- Once the DUO ESD has tripped the trip voltage will be displayed for a short period of time. Assuming the device has passed the test. If the device failed to pass the test – the display will show it has failed and the unit should not be returned to service but either replaced or sent to Power safe for repair.

Test Failed Screen

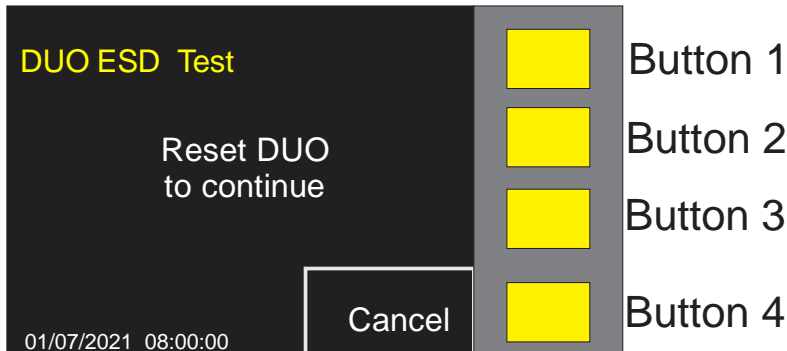


Remove the DUO ESD from service – Replace or send the DUO ESD back for repairs to Powersafe Products.

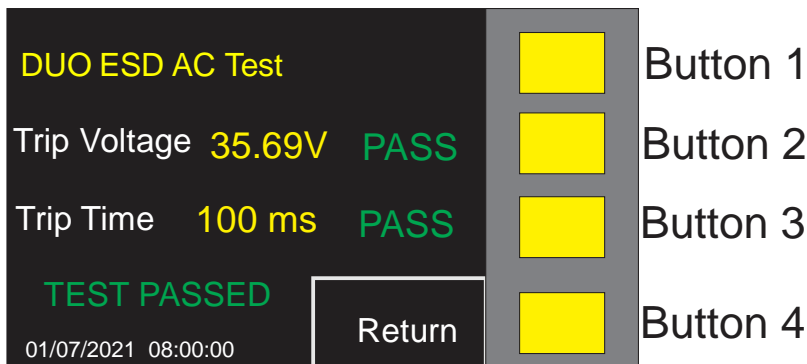


If the Device failed testing : - Press Button 4 – “Return” to return to the main menu.

- If the unit has passed the first test - the display will then show “Reset DUO to continue” – simply reset the DUO ESD to complete test 2 or press Cancel to discontinue the testing.



- The tester will automatically start test 2 once it sees the DUO ESD has been reset and it will apply voltage **above** the trip voltage and measure the time taken for the device to trip.



- If the DUO ESD is within specifications it will then display to the screen the trip voltage and the trip time – if the DUO ESD is not within specifications it will show the device as failed.
- Press “Return “ button (Button 4) as indicated on the display and if a micro SD card is inserted into the device it will record the date, time, trip voltage and trip time to the micro SD card.

⚠️ Disconnect power from the isolation transformer and all other equipment prior to removing the DUO ESD from the tester or any leads to and from the DUO tester or DUO ESD tester. Never under any circumstances remove or connect leads, devices or equipment while under voltage.

5.0 DUO tester Specifications and Calibration

Specifications: DUO tester Model PS01

Supply: 230 V a.c. 50Hz

Max current draw: 500mA

Inlet Fuse size: 500mA slow blow

Operating conditions: 0 to 35 ° C , < 85%RH .

Storage Conditions : 0 to 40° C , < 90% RH. Store in a clean dust free environment away from direct sunlight, high humidity or chemical vapors and/ or fumes.

Calibration:

For calibration return to Power safe Products.

5.1 Cleaning and Maintenance:

Use soft patch slightly moistened with water or alcohol to clean the surface of the casing and the front panel and leave it to dry totally after the cleaning.

Do not use liquids based on petrol!

Do not spill cleaning liquid over the instrument!

Only use the instrument in a dry clean environment and never expose to sunlight, excessive humidity, water or chemicals.

All leads , equipment and devices should be thoroughly inspected prior to use for any damage , cuts or nicks in leads , plugs or sockets and to ensure that they are in generally sound condition for the applied usage.

5.2 Service

In case of any malfunction or if there is any damage noticed at the unit, the unit must be serviced by a competent service department. Contact your dealer or producer of the unit for further information. There are no customer replaceable components at the unit (except fuses (F1 – 500mA slow blow fuse) on the rear panel)!

For repairs contact : Powersafe Products Ph 1800 338 979

5.3 Accessories:

Banana jack leads

The unit is supplied with 1 m banana jack leads with male ends at both ends. If replacing these leads then ensure they are replaced with leads of the correct colour and are rated for greater than 250 V usage.

DUO ESD tester: Test box used with the DUO tester for specifically testing the DUO ESD

DUO ESD Test lead V1 - 2 pin circular connector with test leads for testing DUO ESD – Live side of the DUO ESD connection

DUO ESD Test lead V2 – 3 Pin circular connector with test lead for testing DUO ESD – Load side of the DUO ESD connection

DUO ESD Test Lead V3 – 2 pin circular connection to 240V, 15 A, AS3112 style **socket** for testing power boards with plug, lead and socket with DUO ESD fitted.

DUO ESD Test Lead V4 – 3 pin circular connection to 240V, 15 A, AS3112 style **plug** for testing power boards with plug, lead and socket with DUO ESD fitted.

DUO V4 Tester - test box used with DUO tester for testing the DUO V4 model unit.

6.0 DUO ESD tester specifications and accessories

Operating conditions: 0 to 35 ° C , < 85%RH .

Storage Conditions : 0 to 40° C , < 90% RH. Store in a clean dust free environment away from direct sunlight, high humidity or chemical vapors and/ or fumes.

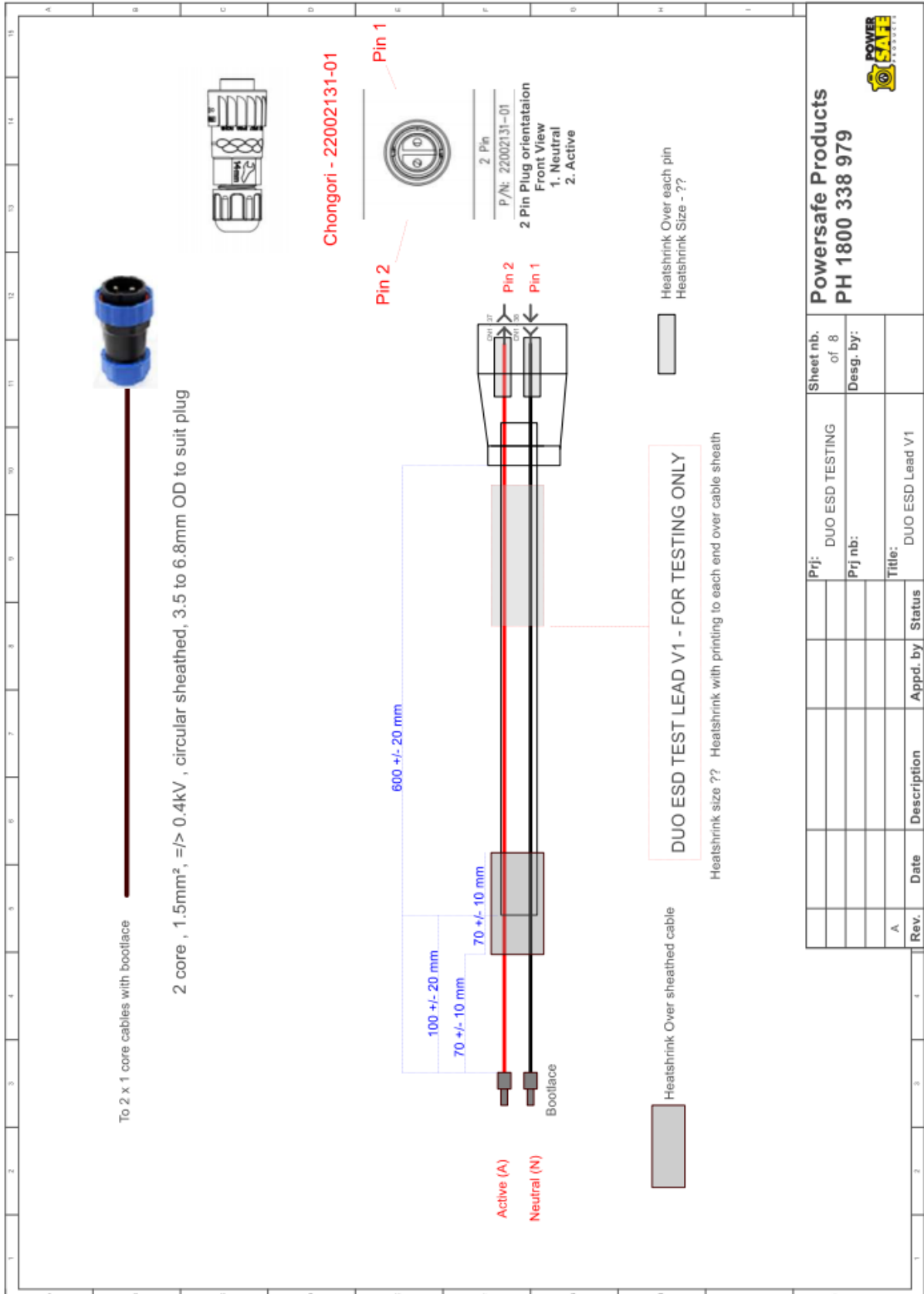
For accessories refer to 5.3

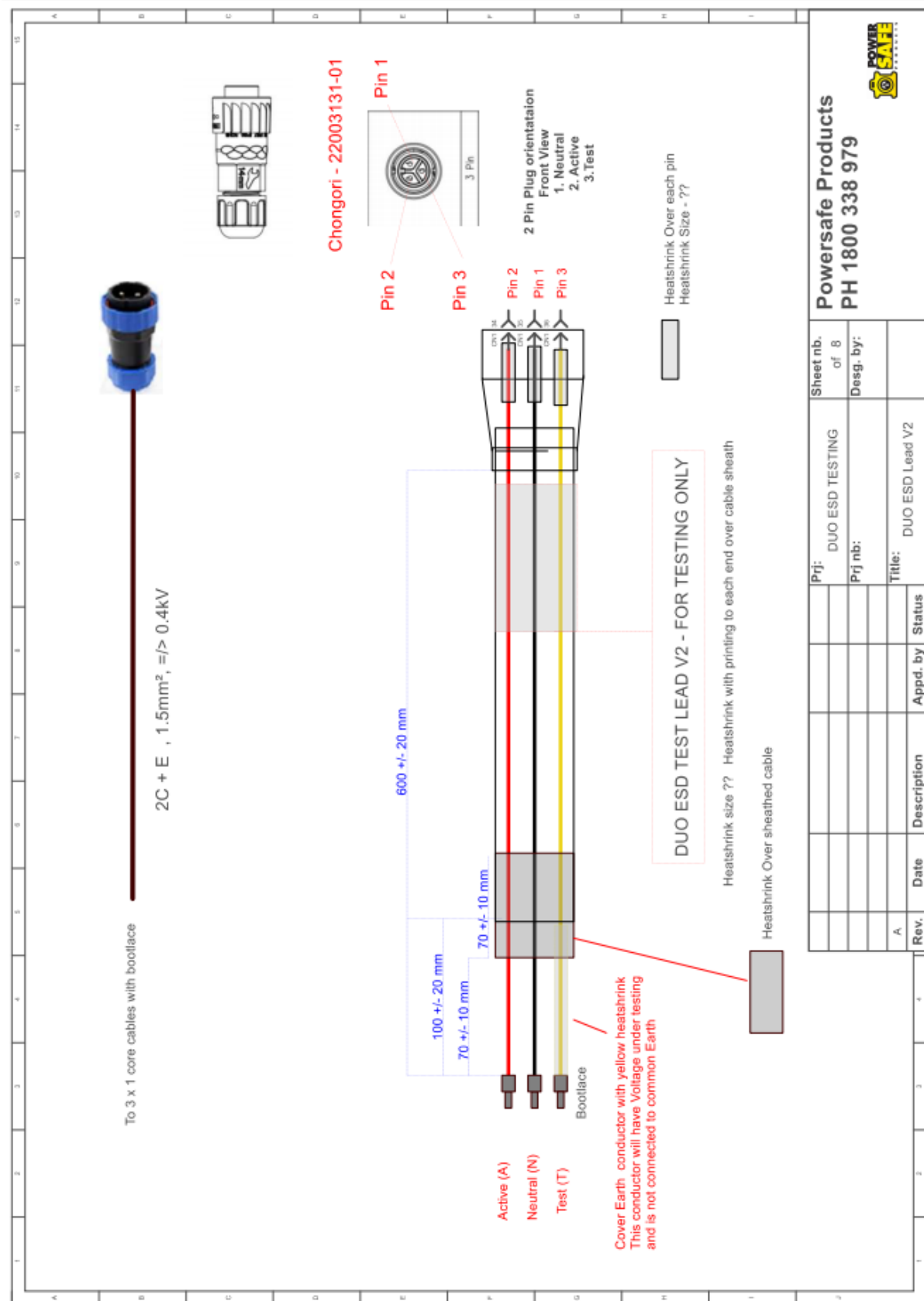
7.0 DUO V4 Tester specifications and accessories

Operating conditions: 0 to 35 ° C , < 85%RH .

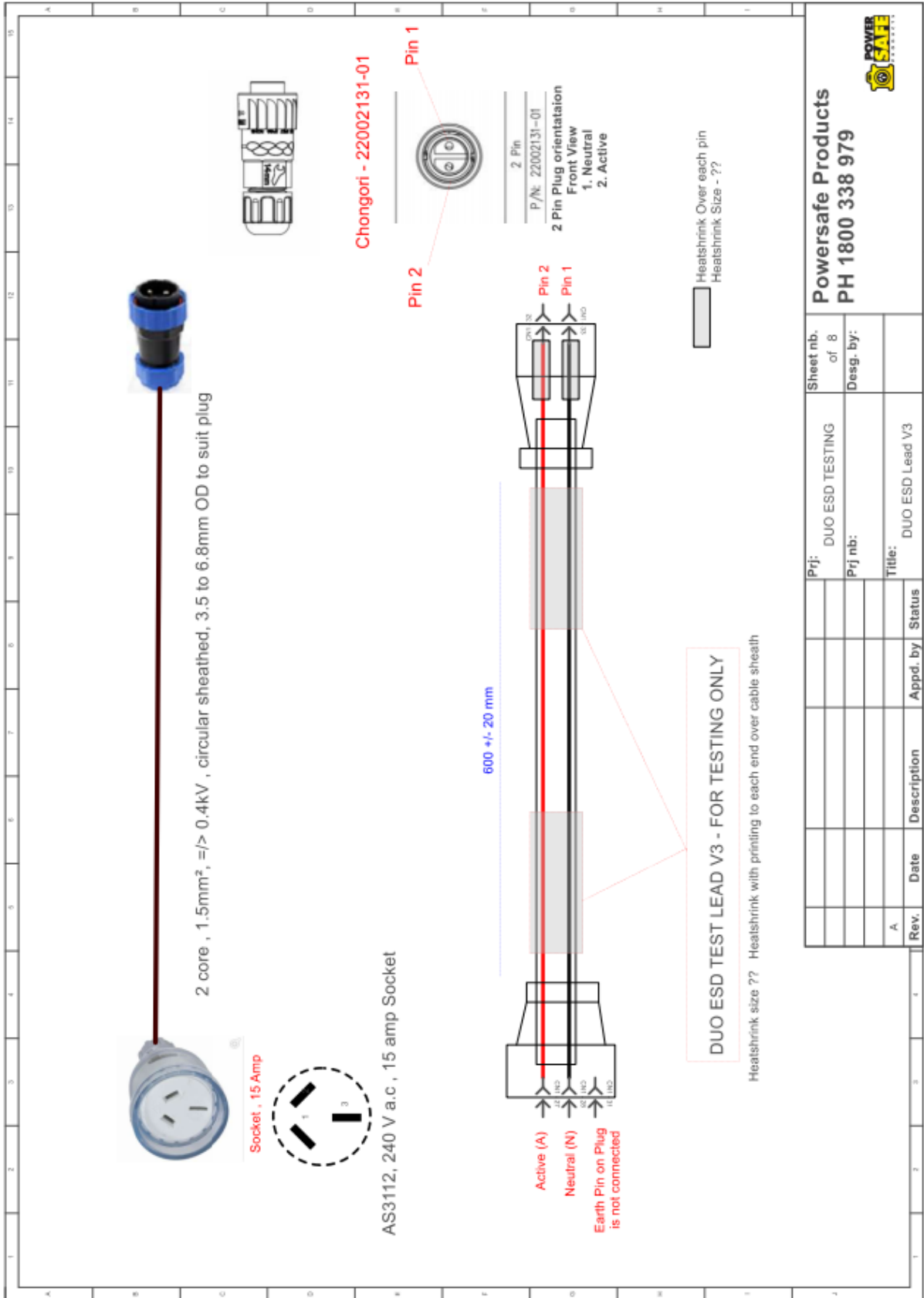
Storage Conditions : 0 to 40° C , < 90% RH. Store in a clean dust free environment away from direct sunlight, high humidity or chemical vapors and/ or fumes.

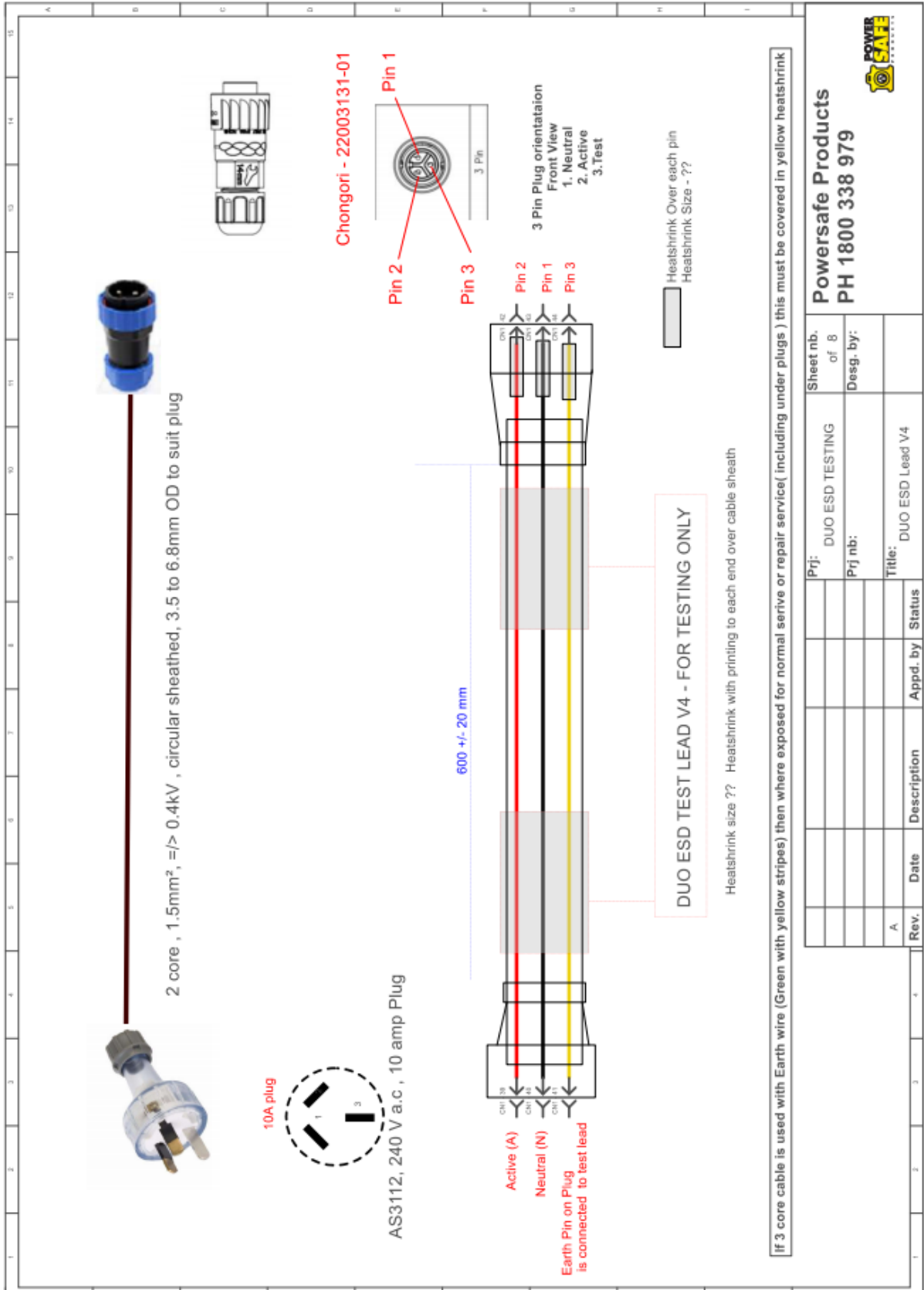
For accessories refer to 5.3





 <p>Powersafe Products PH 1800 338 979</p>		Sheet no.	
		of 8	
Prj:	DUO ESD TESTING	Desg. by:	
Prj nb:		Title:	DUO ESD Lead V2
Rev.	Date	Description	Appd. by Status
A			





Powersafe Products PH 1800 338 979		Sheet no. of 8
Prj: DUO ESD TESTING		Desg. by:
Prj nb:		
Title: DUO ESD Lead V4		
Rev.	Date	Description
A		
Appd. by	Status	