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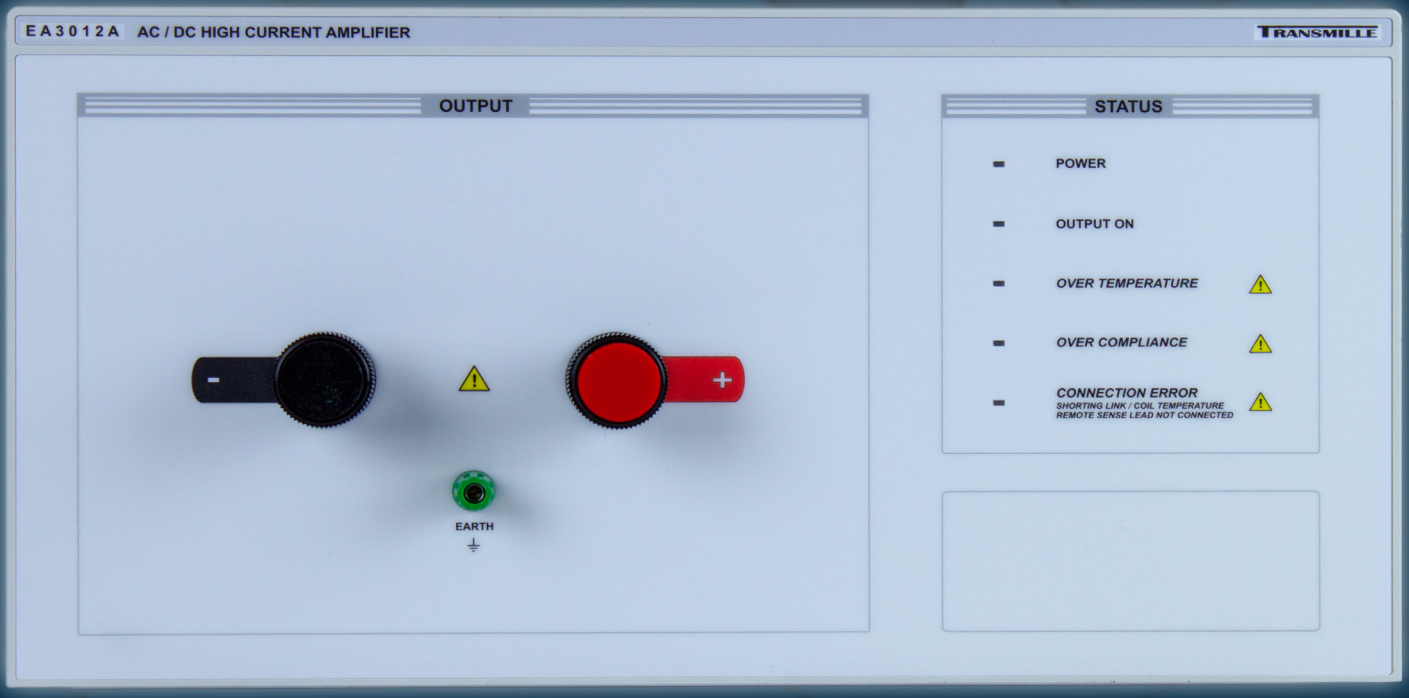

TRANSMILLE EA3012A TRANSCONDUCTANCE AMPLIFIER

OPERATION MANUAL

EA3012A

Transconductance Amplifier

Operation Manual

Version 4.00
May 2018
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Guarantee and service

Transmille Ltd. guarantees this instrument to be free from defects under normal use and service for a period of 1 years from purchase. This guarantee applies only to the original purchaser and does not cover fuses, or any instrument which, in Transmille's opinion, has been modified, misused or subjected to abnormal handling or operating conditions.

Transmille's obligation under this guarantee is limited to replacement or repair of an instrument which is returned to Transmille within the warranty period. If Transmille determines that the fault has been caused by the purchaser, Transmille will contact the purchaser before proceeding with any repair.

To obtain repair under this guarantee the purchaser must send the instrument in its original packaging (carriage prepaid) and a description of the fault to Transmille at the address shown below. The instrument will be repaired at the factory and returned to the purchaser, carriage prepaid.

Note :
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Transmille Ltd.
Unit 4, Select Business Centre
Lodge Road
Staplehurst
Kent
TN12 0QW
United Kingdom

Tel : +44 0 1580 890700
Fax : +44 0 1580 890711

EMail : sales@transmille.com
Web : www.transmille.com

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OPERATIONAL NOTE

The amplifier has a remote cut-out connection on the rear panel.

When using the amplifier directly the output must be *enabled* by inserting the Shorting Link supplied into the rear panel socket shown below.

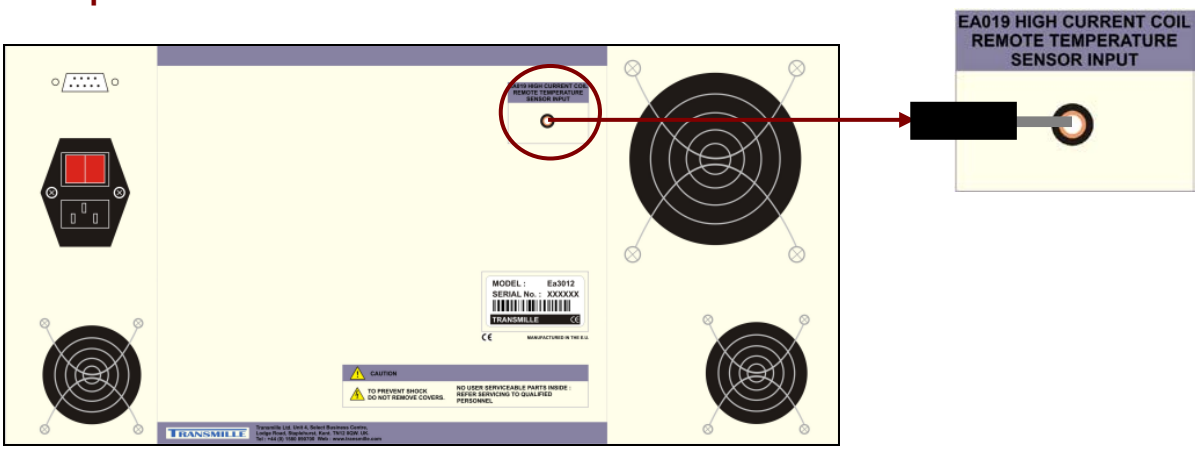


SHORTING LINK

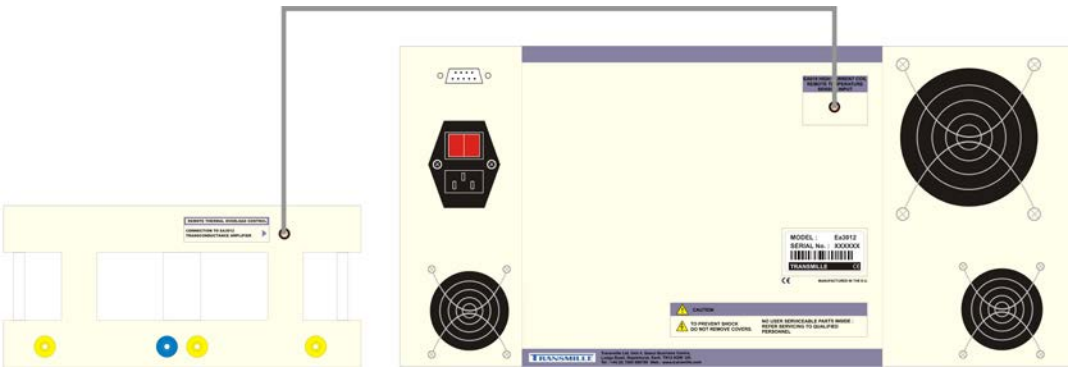
When using the optional EA019 High Current clamp coil connect the amplifier to the thermal trip in the coil using the lead supplied. The thermal cut-out in the coil will turn off the amplifier output to prevent damage to the coil.

NOTE : FOR SAFETY NO OUTPUTS WILL BE AVAILABLE UNTIL EITHER THE SHORTING PLUG OR EA019 COIL ARE CONNECTED

Example – without coil in use :



Example – with Coil in use



EA3012A Transconductance Amplifier



The EA3012A is a powerful linear transconductance amplifier designed exclusively for use with the 3000 Series calibrators which provides a cost effective solution to calibrating high currents instruments.

Connecting to the 3000 Series calibrator using the feature connector, the EA3012A extends the output current range to 100A DC / 75A AC - higher currents are available by paralleling EA3012A's as required to give the current output needed.

Main Features

- **Controlled by Virtual Front Panel Software (Supplied) or ProCal (option)**
- **Stackable for Higher Currents**
- **Low Noise Linear MOSFET Technology**
- **Up to 100A DC • 70A AC Output**
- **Calibration of up to 2000A Clamp Meters Using 50 Turn Coil***
- **Ideal For Calibrating High Power Current Shunts & Current Meters**

*** Requires EA019 enhanced clamp coil adapter with integrated temperature sensor above 1500A**

Design Notes



Use of linear technology throughout gives a very low noise output completely free from any switching spikes.

The latest in high power MOSFET design ensures reliable and stable operation even into inductive loads.

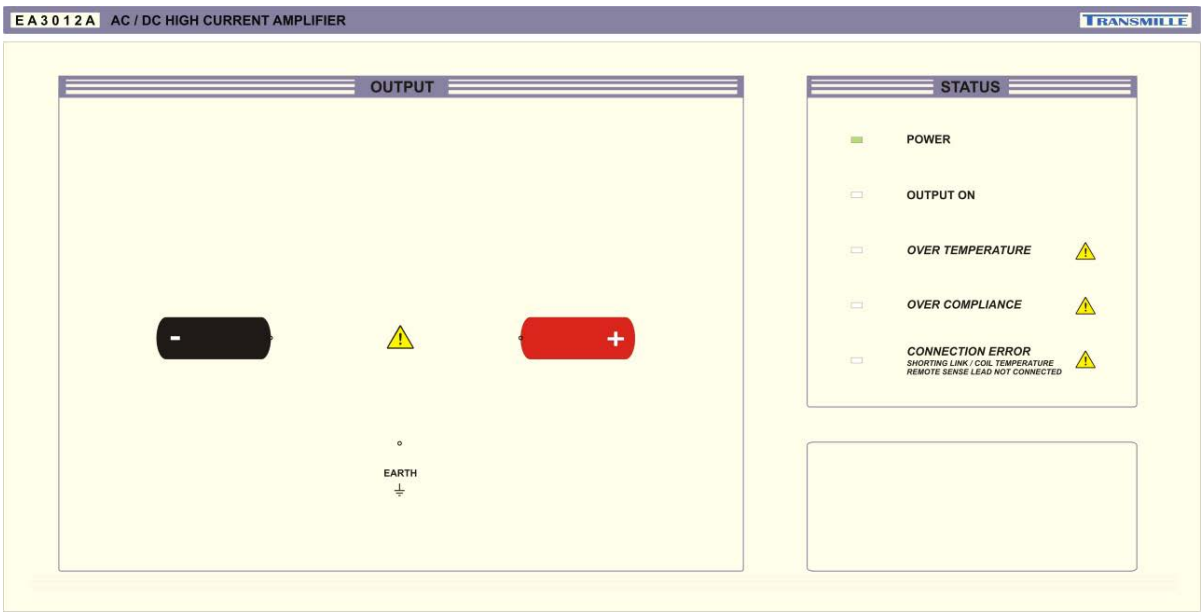
Long term accuracy is assured by using precision foil resistors and a custom manufactured internal shunt.

Features

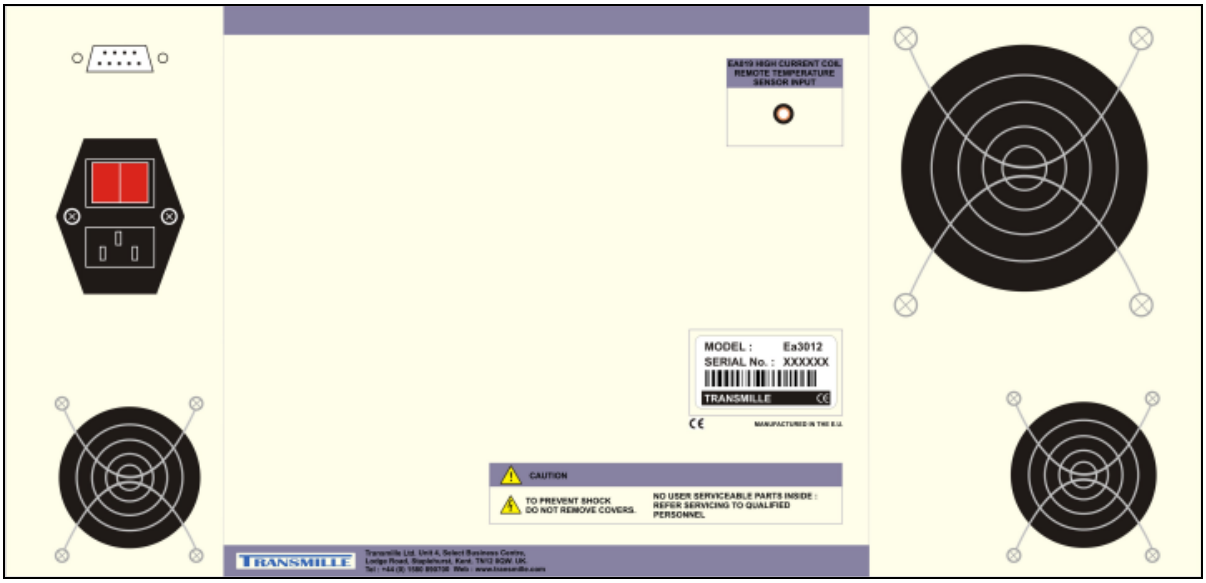
Functions of the terminal post connections :

EA3012A Terminal Post	Function
CURRENT HI	Positive output to UUT
CURRENT LO	Negative output to UUT
EARTH	Connected to the case

Front Panel LED Indicators

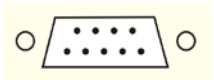


Indicator	Description
POWER	Power connected and instrument switched on
OUTPUT ON	Instrument output switch on – current actively being output from front panel terminals
OVER TEMPERATURE	Temperature of internal heatsinks exceeds operating limits – output switched off to allow cooling of heatsinks
OVER COMPLIANCE	Compliance voltage exceeds operating parameters – ensure correct connection to front panel terminals
CONNECTION ERROR **SHORTING LINK / COIL TEMPERATURE REMOTE SENSE LEAD NOT CONNECTED**	The shorting link supplied with the amplifier is not connected to the rear panel (no coil in use) or the remote temperature sense lead is not connected from the EA019 High Current Coil (option) to the amplifier.

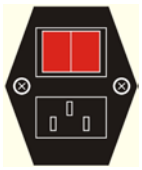


Label Reference	Information
Model Number	Model number reference for product
Serial Number	Unique serial number for product

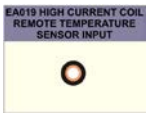
Rear Panel Connections



Connection to the 3000 Series adapter interface is provided via a 9-Pin D-Type



IEC line input and illuminated power switch



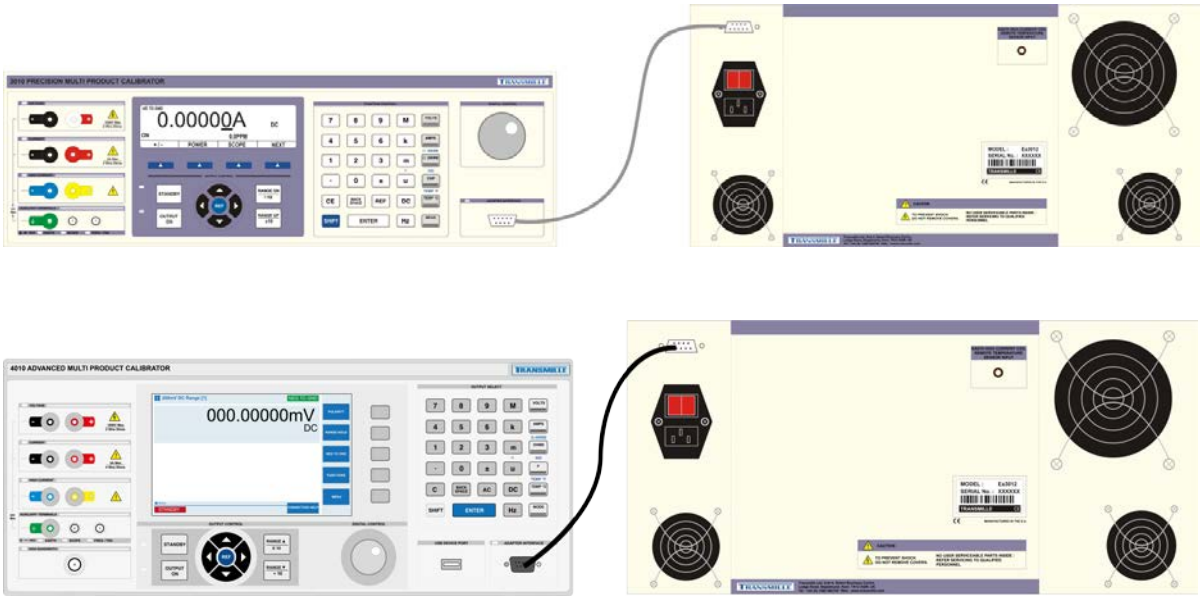
Remote thermal cut-out control for use with EA019 2000A Clamp Coil adapter (option)

Operating Notes

This section details operational and environmental considerations for the EA3012A Transconductance Amplifier. Follow these instructions when operating or storing the transconductance amplifier

Connection Recommendations

To connect the EA3012A Transconductance Amplifier to the 3000A Series Multi Product Calibrator and 4000 Series Advanced Multiproduct Calibrator, use the supplied adapter interface cable (9-Pin Male to 9-Pin female straight through lead) :



To use the transconductance amplifier, connect the positive and negative outputs to the unit under test as shown below (current shunt UUT shown as example) :

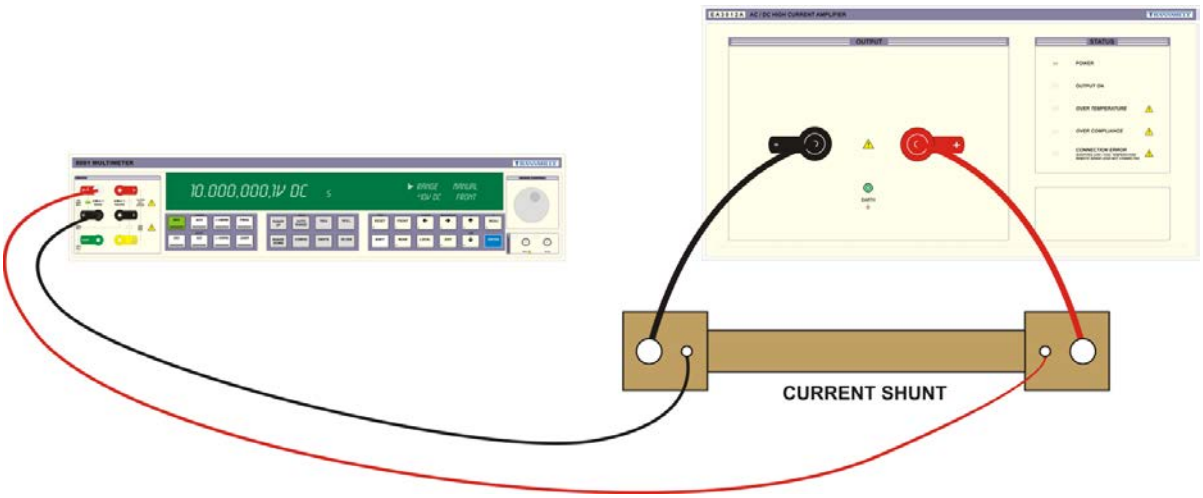


Fig. 1 : Shunt Connection Example

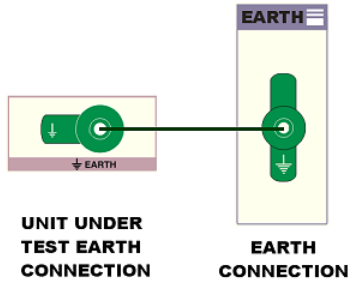


Fig. 2 : Earth Connection Example

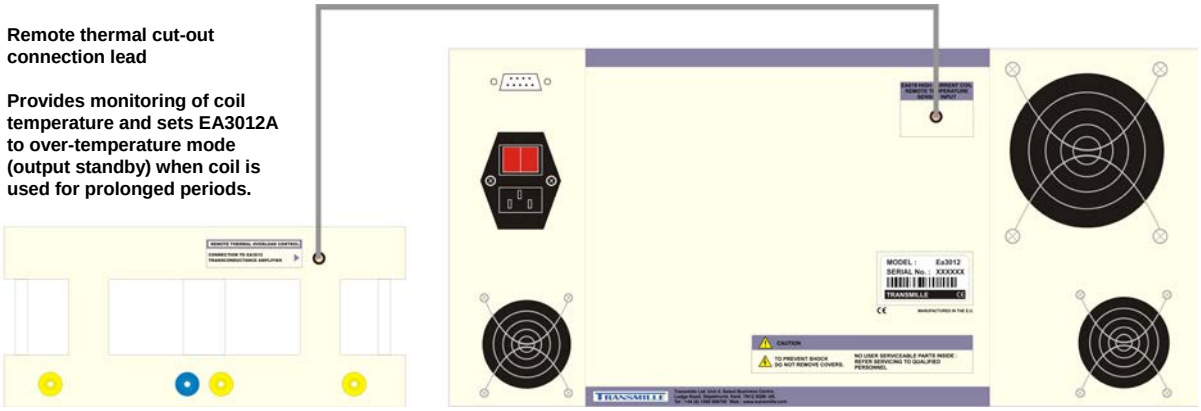


Fig. 3 : EA3012A remote thermal cut-out control to EA019 2000A Clamp Coil adapter (option) using supplied lead.

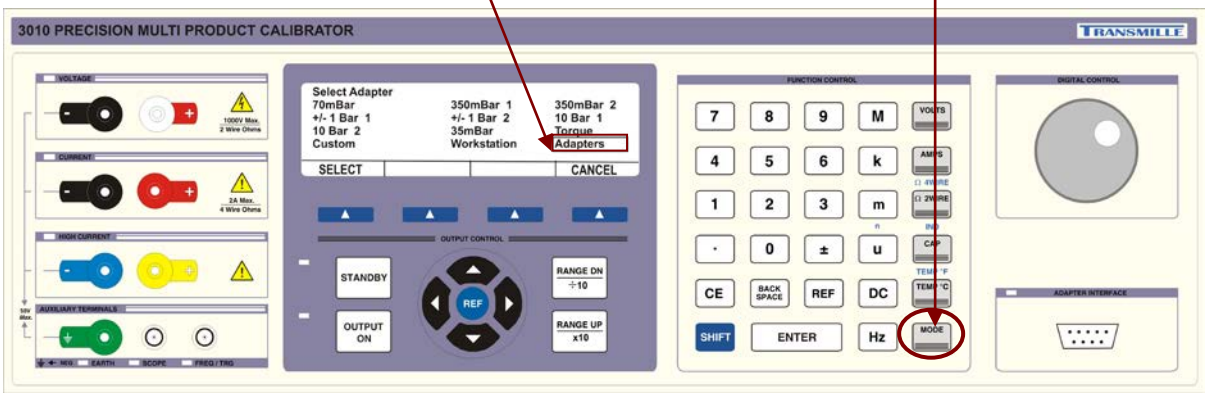
Using the EA3012A from the 3000A Front Panel*

The 3000A Series calibrators provide front panel control of the transconductance amplifier. This can be accessed using the mode function button followed by on-screen menus as follows :

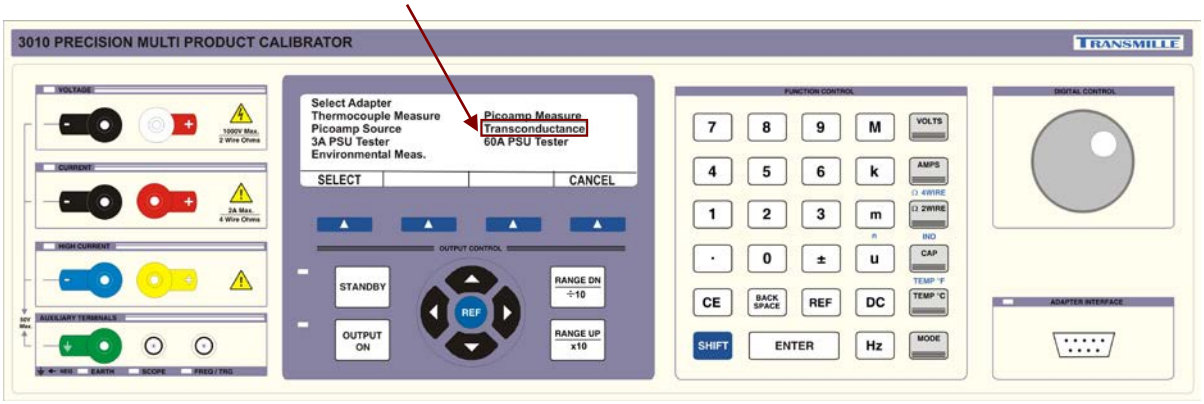
Selecting the Transconductance amplifier mode :

1. Press the MODE button to select the require adapter

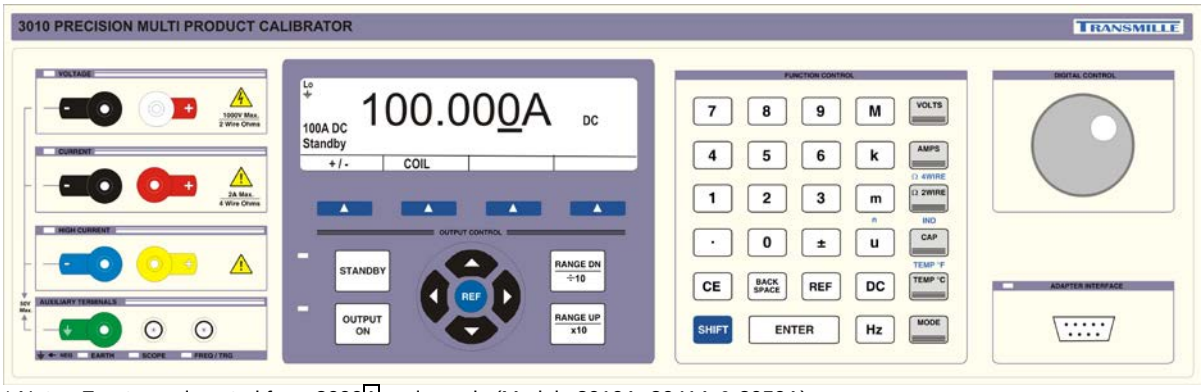
2. Use the cursor keys to select the Adapters menu item



3. Select the Transconductance menu item



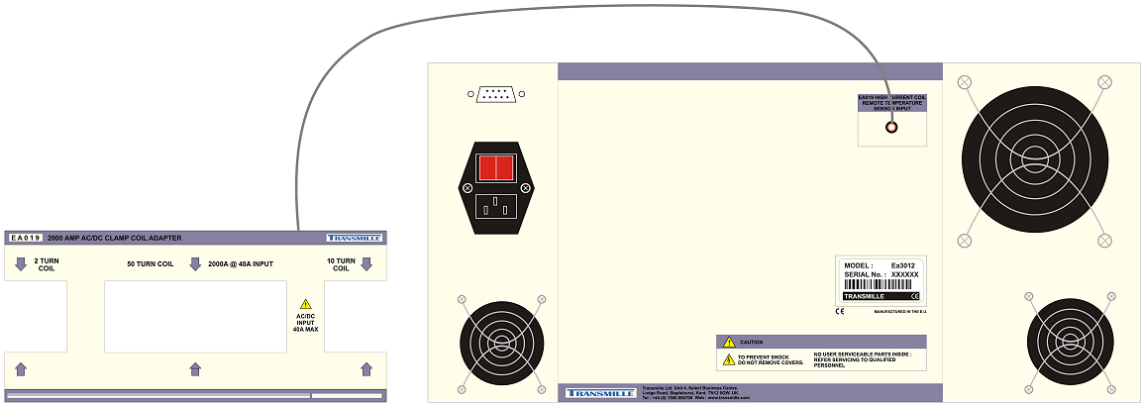
4. Enter current required and press OUTPUT ON to output high current from amplifier terminals. Select AC or DC as required (Note : Max frequency on AC is 400Hz)



* Note : Front panel control from 3000A series only (Models 3010A, 3041A & 3050A)

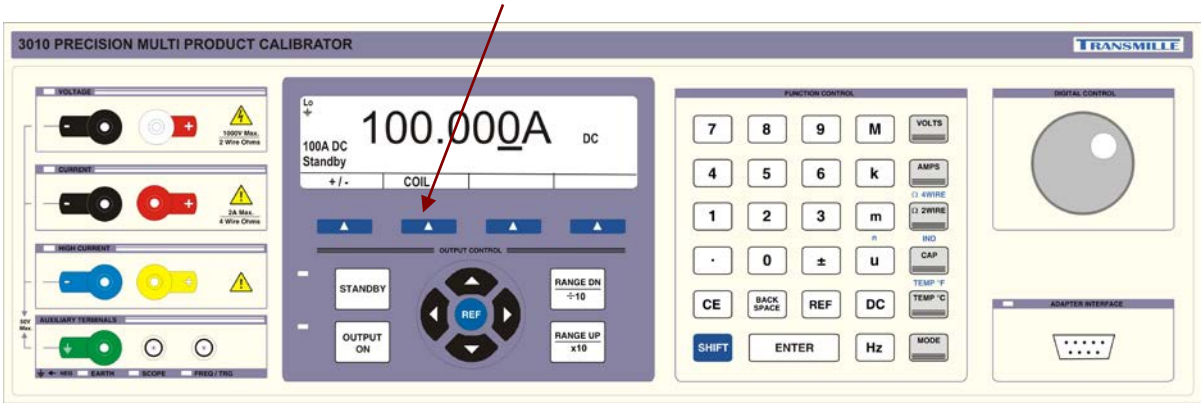
Using the EA019 High Current Coil with 3000A Front Panel Control

The optional EA019 high current coil can be connected as per below and the output scaled to suit the coil in use :

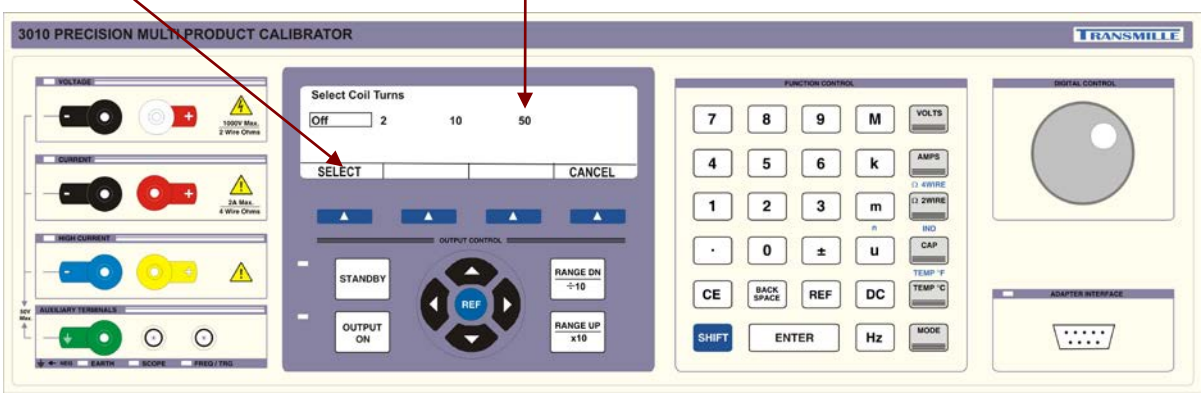


To set the coil in use (connect amplifier to rear mounted coil terminals), select the number of turns as follows :

1. Select COIL mode using the softkey below the display :



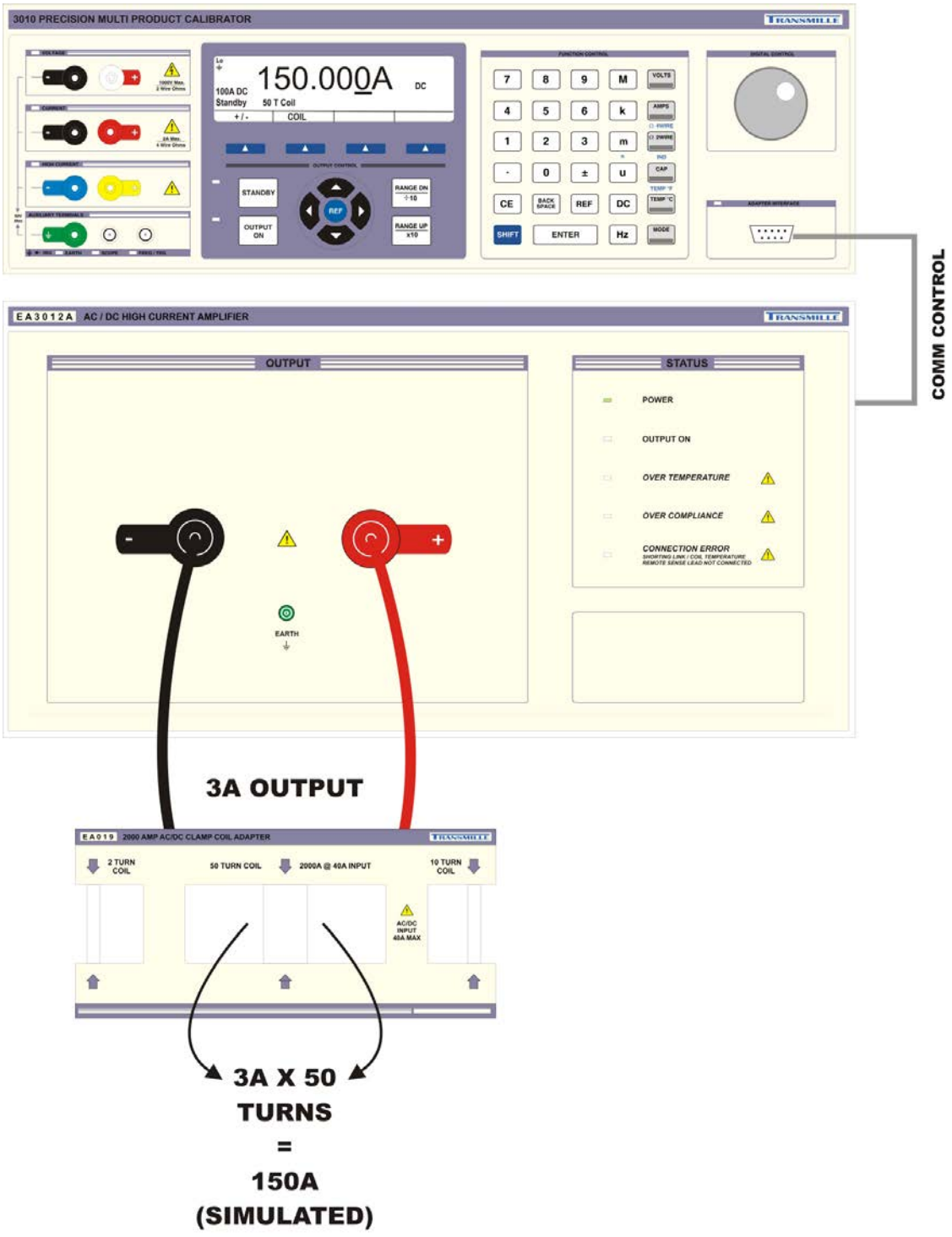
2. Select number of coil turns to use via the cursor keys, connect the amplifier to the correct terminals on the coil (eg. 50 turn terminals) then press the SELECT softkey:



Note : To return to normal use without coil, simply select OFF in coil turns menu

3. With the number of coil turns in use, the calibrator will automatically calculate the correct current to output from the amplifier to achieve the desired simulated current via to coil. For example selecting the 50 turn coil, and entering 150A will actually output 3A through the 50 turn coil to simulate 150A

Note : The correct coil must be connected to the amplifier using the supplied coil leads by the user – if the incorrect coil is connected, the output value will not read correctly on the clamp meter.



Using the EA3012A from the 4000 Series Front Panel*

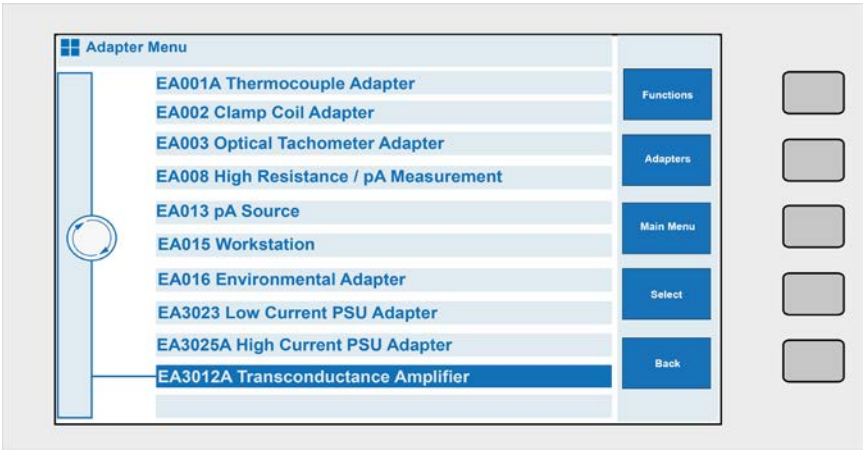
The 4000 Series Advanced calibrators provide front panel control of the transconductance amplifier. This can be accessed using the mode function button followed by on-screen menus as follows :

Selecting the Transconductance amplifier mode :

1. Press the 

button to display the ADAPTER menu

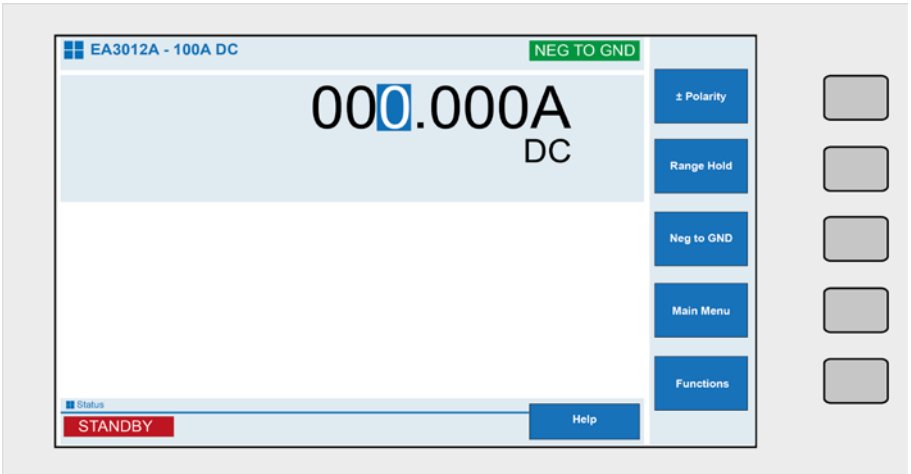
2. Select EA3012A Transconductance Amplifier from the list of adapters.



3. The calibrator will switch to output DC Current via the EA3012A

4. Enter current required and press 

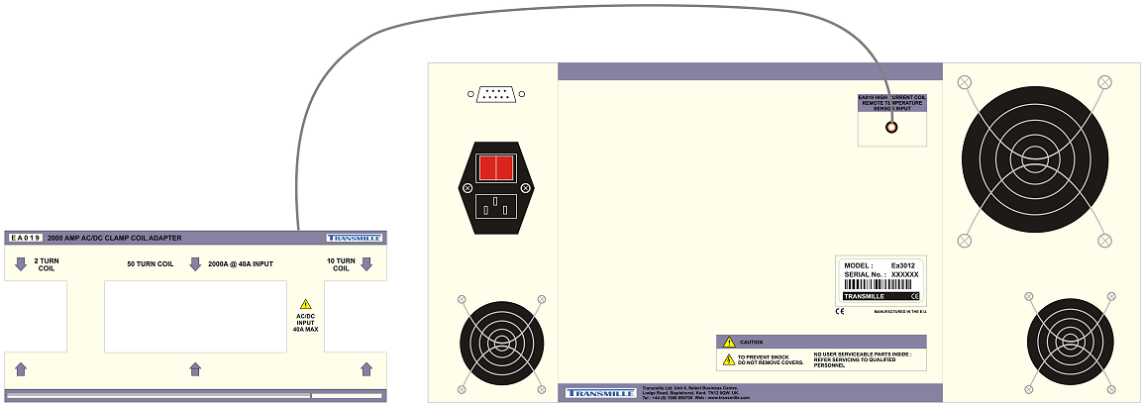
to output high current from amplifier terminals. Select AC or DC as required (Note : Max frequency on AC is 400Hz)



* Note : Front panel control requires UI Version 3.0.5. For updates please contact Transmille at support@transmille.com

Using the EA019 High Current Coil with 4000 Series Front Panel Control

The optional EA019 high current coil can be connected as per below and the output scaled to suit the coil in use :



To set the coil in use (connect amplifier to rear mounted coil terminals), select the number of turns as follows :

1. Connect the appropriate number of turns via the rear mounted coil terminals (2, 10 or 50)
2. Enter the divided value via the keyboard on the front of the 4000 Series. For example, to simulate 2000A using the 50 turn coil of the EA019, enter 40A (40A x 50 = 2000A)

Note : The correct coil must be connected to the amplifier using the supplied coil leads by the user – if the incorrect coil is connected, the output value will not read correctly on the clamp meter.

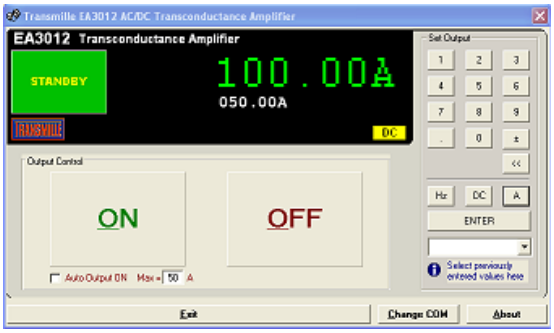
Using the EA3012A with the Virtual Front Panel Software

Installing the Software

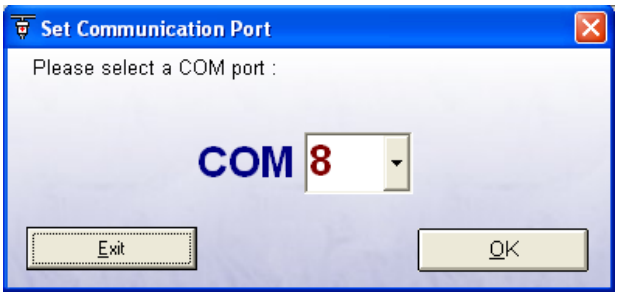
Insert the CD supplied with the EA3012A Transconductance Amplifier – this should auto run. If it does not auto run, click START -> Run then run x:\Setup.exe where x is the drive letter of your CD drive.

Once installation is complete choose START -> ALL PROGRAMS -> EA3012A Transconductance Amplifier to run the virtual front panel





Selecting a COM Port



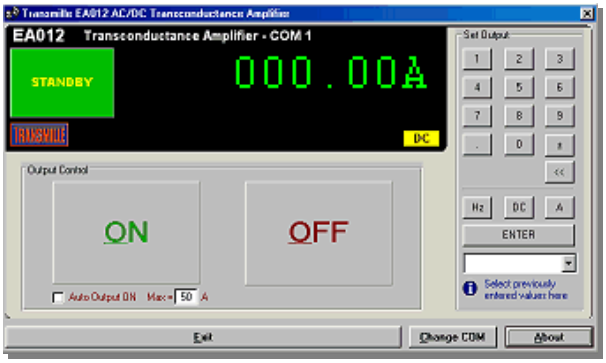
On starting the virtual front panel for the first time, a COM port selection screen will be displayed. Click on the COM port which is connected to your 3000 Series calibrator to continue.

A different COM port can be selected at any time using the Change COM button.

If you are using a laptop to connect to the calibrator, the COM port will usually be COM 1. A desktop computer will usually be COM 2

Operation of the Virtual Front Panel

Once the correct COM port is selected, the calibrator will be detected, and the main screen displayed :



The main screen comprises of a main reading display and output select buttons.

AC/DC mode is indicated on the main display by
DC or AC

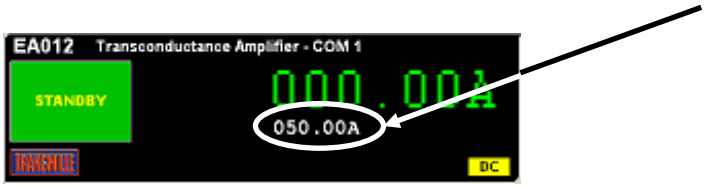
Functions : Setting a Current Output

The DC current function output up to a maximum of 100A. There are three methods for entering a value :

1 : Type in a value using the keypad followed by



After pressing the ‘A’ button, the value will be shown in the ‘pre select’ area below the main output display



Pressing 

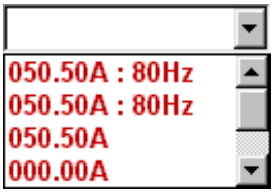
will confirm the output and set this to the main display

2 : Type a value into the list box



Then press enter on the PC keyboard – this will set the value directly to the main display (no preselect)

3 : Select a previously entered value (which is stored in the drop down list)



This will set the value directly to the main display (no preselect) unless Auto Output ON mode is set (see below). The output will remain off until the output ON button is pressed. This will also initiate the high current thermal protect mode if the current is > 50A (see high current operation section).



Functions : AC Output

To set AC output, all that is necessary is to enter a frequency using the Hz button. To set back to DC at any time, simply enter zero Hz or press DC.

Auto Output mode

By clicking the Auto Output ON checkbox, values can be output immediately without having to use the output control ON or OFF buttons.

This output control works together with a limit control to determine the maximum current up to which the output will be turned on automatically.

Simply enter the maximum current allowed for auto output ON – the output will only switch on automatically if the current value set is less than the value entered in the MAX. box.



High Current Operation

For current output above 50A, the virtual front panel employs a thermal protection mode. This activates as soon as a current above 50A (AC or DC) is set and allows a maximum of 30s continuous output above this 50A limit.

The front panel display will indicate the remaining time allowed for continuous operation before standby is automatically selected :



TIMEOUT IN 28s

After the 30 seconds has elapsed, the output will be limited to a maximum of 50A for a further period of 30s, to allow for unit cooling.



50A LIMIT FOR 21s

Output Error Detection

If the calibrator controlling the transconductance amplifier should detect an output error (eg. terminals open circuit), the virtual front panel program will display

OUTPUT ERROR

The output will also be set to standby.

Specifications

GENERAL SPECIFICATIONS	
Output Connections	**2x Screw terminals**
Mains Supply	**110V/240V @ 50Hz/60Hz**
Power Consumption	**400W**
Cooling	**Internal fans**
Control Interface	**9 Pin 'D' type connector for use with 3000 Series adapter interface** **3.5mm socket for remote thermal cut-out control**
Dimensions	**22cm x 43cm x 46cm (5U Height)**
Weight	**26kg**

PERFORMANCE SPECIFICATIONS	
AC Output	**70A maximum**
DC Output	**100A Maximum**
AC / DC Accuracy	**0.08% + 10mA**
Compliance Voltage	**6V Pk-Pk**
Indicators	**Output On** **Power On** **Over Temperature** **Over Compliance**
Frequency	**DC to 400Hz**

Care & Maintenance

The only maintenance instructions for the EA3012A Transconductance Amplifier is periodic cleaning. See below for details on the cleaning procedure and precautions for handling.

Cleaning the EA3012A

To keep the external enclosure of the EA3012A in good condition, clean the outer case with a soft cloth. Do not use any liquids in cleaning the enclosure – removal of surface dust is all that is recommended.

CAUTION

Do not use cleaning fluids or solvents for cleaning as these may damage the enclosure and affect the plastic materials used in the transconductance amplifier.

Handling Precautions

The EA3012A is designed for mechanical stability, but should not be subjected to excessive shock or be dropped. Transportation is recommended using the original packaging with avoidance of extreme changes of temperature.

Servicing Information

The EA3012A is provided certified from the factory and uses high precision non-adjustable shunts and are not user repairable. If the instrument is damaged it should be returned to the factory for repair.

Recalibration

The EA3012A should be certified based upon the users requirements. During routine verification adjustments should not be necessary. If adjustments are required, then full adjustment guides are available on request from Transmille. Verification and Adjustment should be performed by trained personnel only at laboratories or facilities with suitable equipment and capability to perform this task

Support

Support for the EA3012A (and all Transmille products and software) is available by email (support@transmille.com) or via our support system (http://support.transmille.com)

ABOUT US

We truly believe in offering Solutions in Calibration, offering bespoke solutions for calibration laboratories and manufacturers across the globe. Our mission statement is not just a phrase, it is our design and support philosophy, offering support and advice that cannot be found elsewhere with a friendly atmosphere.

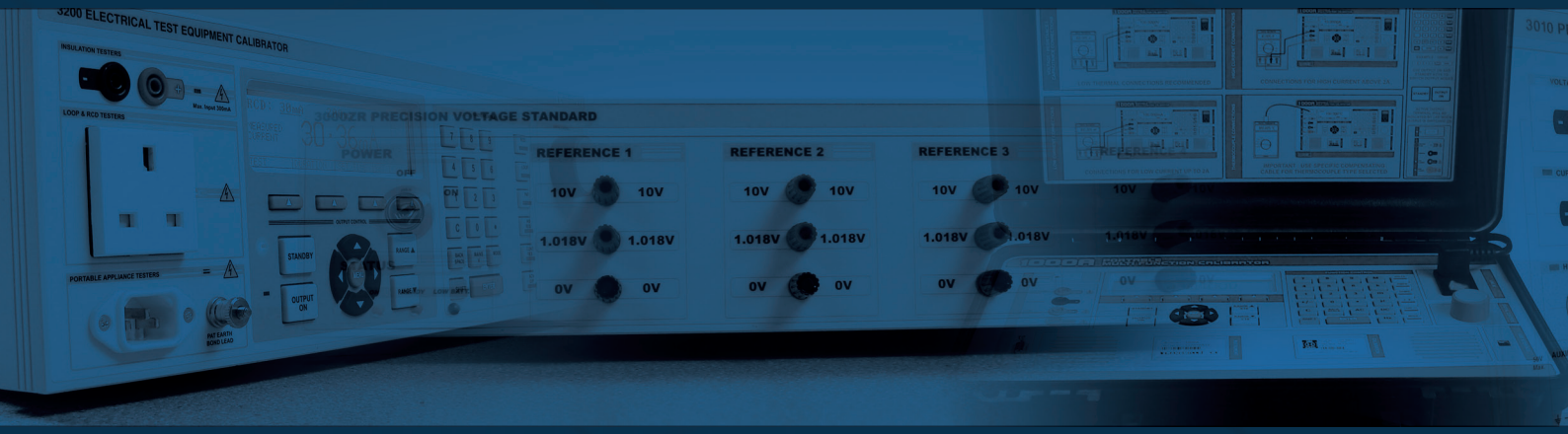
Transmille was founded in 1997 as a commercial calibration service, and soon after began to develop and manufacture a range of electrical calibration products and software to answer a growing requirement for solutions to common problems. Following this small beginning, Transmille has worked year on year to provide unique equipment and software to benefit calibration laboratories and manufacturers across the globe.

Ever since releasing the very first products Transmille have continued to innovate and develop new products for the metrology community, from world first products such as the 2100 Electrical Test Equipment calibrator, through to the worlds lowest cost multi product calibrator the 1000 series.

Transmille now produce over 600+ calibration instruments per year, shipping instruments to customers ranging from National Standards Laboratories and manufacturers through to small calibration test houses around the world.

An unrivalled commitment to quality and innovation drives Transmille forwards, with a dedicated design and support team in house with a combined experience of over 60 years in manufacture and design of electrical calibration products and software.

With local distributors across the globe, we can offer one to one personalised support, no matter how large or small the customer.



Unit 4, Select Business Centre,
Lodge Road, Staplehurst, Kent
TN12 0QW. United Kingdom

Main Office : +44 (0) 1580 890700
sales@transmille.com
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