CBA 400M-100
1 MHZ TO 400 MHZ
100 WATT AMPLIFIER

USER MANUAL

601-298A

TESEQ

Advanced Test Solutions for EMC

CBA 400M-100
1 MHZ TO 400 MHZ
100 WATT AMPLIFIER

USER MANUAL

CONTENTS

1 SAFETY INFORMATION

This apparatus has been designed and tested in accordance with BS EN 61010-1, and has been supplied in a safe condition. This manual contains some information warnings which must be followed to ensure safe operation, and to retain the apparatus in a safe condition.

This apparatus does not incorporate components liable to explode or implode during normal operating conditions.

In normal operating conditions this apparatus does not liberate injurious or poisonous gases.

Sound levels of this apparatus after installation in a rack are below 85 dBA, as required by EN 61010-1. However local regulations may have a lower limit or the system as a whole may exceed the local limit. In this case appropriate action should be taken, ie of use of any protective equipment required by local regulations.

This apparatus is of installation category 2.

This apparatus is capable of delivering harmful levels of radio frequency power. Ensure at all times during operation that the RF output is properly terminated with an adequately rated termination or transducer, and that the cables and connectors attached to the apparatus are in good condition.

The mains plug shall only be inserted in a socket outlet provided with a protective earth contact. The protective action must not be negated by the use of an extension cord without a protective conductor.

The opening of covers or removal of parts is likely to expose live parts.

This apparatus must be disconnected from all voltage sources before it is opened for adjustment, replacement, maintenance or repair.

Make sure that only fuses of the required rated current and of the specified type are used for replacement. The use of makeshift fuses and the short-circuiting of fuse holders is prohibited.

2 INTRODUCTION

CBA 400M-100 Introduction

The CBA 400M-100 is an amplifier capable of supplying 100 watts into a 50 ohm load over the frequency range 1 MHz to 400 MHz, during the course of EMC tests on electrical equipment. The amplifier is designed with sufficient gain such that it may be used with normal output levels of signal sources. A safety interlock on the rear panel is also provided, which will mute the amplifier when grounded.

The unit is powered from a switched mode power supply for high efficiency, high power factor and wide voltage range operation. The unit is air cooled with integral fans, and is protected against faulty cooling by excess temperature sensing.

A front panel indicator is provided to indicate over-temperature. The amplifier is designed for rugged operation into a variety of loads. The amplifier is primarily intended for use as a power source for EMC susceptibility testing, but is also applicable to other systems requiring a wide-band linear amplifier.

This amplifier is designated as 'professional equipment' and should not be operated by untrained staff.

As this product has the capability to generate high levels of RF energy it is not intended for use in a residential environment.

Potential or theoretical hazards.

Threat	Precaution
Exposure of personnel to high RF fields produced by an antenna connected to the output of the amplifier.	Ensure that the antenna is inside a screened enclosure and fit an interlock to the entry door to prevent access while the amplifier is operating.
RF burns caused by contact with the antenna connected to the output of the amplifier.	Ensure that the antenna is inside a screened enclosure and fit an interlock to the entry door to prevent access while the amplifier is operating.
Amplifier self oscillation caused by feedback from un-terminated connectors.	This is an unlikely but theoretical possibility. Always ensure that the amplifier input is terminated either by the system signal generator or by a suitable RF load/attenuator before switching the amplifier on.
Arcing due to high RF voltages present at the output connector.	Always ensure that the output of the amplifier is terminated either by the system antenna or a suitable high power RF load or attenuator.

3 UNPACKING AND INSTALLATION

3.1 Unpacking

The CBA 1400M-100 package should contain: -

1 to 400 MHz Amplifier	CBA 400M-100
Power cable (UK)	
Power cable (USA / JAPAN)	
Power cable (EUROPE)	
Spare fuse T 10 A time delay 20 mm	
CBA 400M-100 Operating manual (this document)	
Calibration report	

If any signs of damage are found, no attempt should be made to install the instrument, which should be returned to Teseq or their agent. If the shipping carton has been damaged, retain the shipping carton and packing material for the carrier's inspection. Check that the equipment is complete as in the packing list above.

3.2 Installation

! **This instrument must be earthed.**

4 OPERATION

4.1 Front panel

Mains switch

Operating the mains switch will apply power to the amplifier gain stages and fan.

Power indicator

This indicator will illuminate when the mains switch is turned on, and power is available from the mains.

Fault indicator

Should the amplifier be subject to a failing in the cooling system, either by a fan failure, inadequate air supply or excess ambient temperature, this indicator will illuminate and the amplifier gain stages will all be turned off. This action is non-latching, so the gain stages will switch on again when the amplifier has cooled down.

RF input (depending on model)

The RF input will accept a signal from an RF generator. This input must be within the operating frequency range of the amplifier. An amplitude of up to 0 dBm will be sufficient to saturate the amplifier. Operation outside the specified frequency range should not be attempted, and may subject the amplifier to undue internal stress.

RF output (depending on model)

This connector must be suitably terminated at all times during operation. Ensure that the cable and load are all capable of handling the power available, which may be as much as 200 watts. On no account operate the amplifier without a proper termination or with defective cables or connectors. The centre conductor of the RF output represents a severe burn hazard to personnel.

Air Inlet
The amplifier depends upon a free air supply for cooling. Ensure that the front air inlet is not restricted.

4.2 Rear panel

Mains input
The mains input is an IEC 60320 type. The cable attached to the mains input must be rated at 10 A to ensure proper operation at the minimum line voltage of 85 Vac. The fuse-holder is integral with this mains connector. Use 10 A anti-surge (T).

Input/output (depending on model)
The RF input and output connectors may optionally be placed on the rear panel.

Fan outlet
The amplifier depends upon a free air supply for cooling. Ensure that the fan outlets are not restricted.

5 SPECIFICATION

The following specification applies over the operational temperature and frequency range unless otherwise stated, and does not include the characteristics of connecting cables.

Frequency range (instantaneous)	1-400 MHz
Rated output power	100 W minimum (>140 W typical)
Output power at 1 dB gain compression	75 W minimum (>100 W typical)
Gain	51 dB
Third order intercept point	61 dBm
Gain variation with frequency	±2 dB
Harmonics at 15 W output power	Better than -20 dBc
Output impedance	50 Ohms
Stability	Unconditional
Output VSWR tolerance	Infinity:1
Input VSWR	2:1
RF connector style	Type N female
Safety interlock	BNC female, s/c to mute
USB interface	Optional
EMC and Safety	
Conducted and radiated emissions	EN 61326 class A
Conducted and radiated immunity	EN 61326: 1997 table 1
Mains harmonic currents	EN 61000-3-2
Voltage fluctuations and flicker	EN 61000-3-3
Safety	EN 61010-1

Power	
Supply voltage (1-phase)	85-264 Vac
Supply frequency range	47-63 Hz
Supply power	<1 kVA
Mains connector	IEC 320
Environmental	
Operating temperature range	0-40°C
Mechanical	
Case dimensions	19 inch, 4U case, 440 mm deep
Weight	17 kg

Options (select at time of ordering)

341-715 Bench model with front panel mounted input/output connectors

341-815 Rack mountable with front panel mounted input/output connectors

Notes

1 The third order intercept point is a nominal value, as its calculation depends upon the power level at which distortion measurements are made.

2 Output VSWR tolerance is specified for excitation within the permitted levels and frequency range.

6 WARRANTY

Hardware

Teseq limited (the company) warrants its amplifiers to be free from defects in workmanship and materials, under normal use and service, for three years from the date of purchase from the company or its authorised agent.

If a product does not operate as warranted during the warranty period, the company shall, at its option, repair the defective product or part, deliver an equivalent product or part to replace the defective item, or refund the purchase price paid for the defective product. Transportation of the defective product or part to the factory or service centre is to be pre-paid by the customer. All products that are replaced will become the property of the company. Any replaced or repaired product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer.

All information in this manual is given in good faith. However, the company shall not be liable for any loss or damage whatsoever arising from the use of this manual, the product described in it or any errors or omissions in either.

NOTES

Headquarters
Teseq AG
4542 Luterbach, Switzerland
T +41 32 681 40 40
F +41 32 681 40 48
sales@teseq.com
www.teseq.com

China
Teseq Company Limited
T +86 10 8460 8080
F +86 10 8460 8078
chinasales@teseq.com

Germany
Teseq GmbH
T +49 30 5659 8835
F +49 30 5659 8834
desales@teseq.com

Singapore
Teseq Pte Ltd.
T +65 6846 2488
F +65 6841 4282
singaporesales@teseq.com

Taiwan
Teseq Ltd.
T +886 2 2917 8080
F +886 2 2917 2626
taiwansales@teseq.com

USA
Teseq Inc.
T +1 732 417 0501
F +1 732 417 0511
Toll free +1 888 417 0501
usasales@teseq.com

To find your local partner within Teseq®'s global network, please go to **www.teseq.com**

Manufacturer
Teseq AG
4542 Luterbach, Switzerland
T +41 32 681 40 40
F +41 32 681 40 48
sales@teseq.com

France
Teseq Sarl
T +33 1 39 47 42 21
F +33 1 39 47 40 92
francesales@teseq.com

Japan
Teseq K.K.
T +81 3 5725 9460
F +81 3 5725 9461
japansales@teseq.com

Switzerland
Teseq AG
T +41 32 681 40 50
F +41 32 681 40 48
sales@teseq.com

UK
Teseq Ltd.
T +44 845 074 0660
F +44 845 074 0656
uksales@teseq.com