

Reference Manual

Precision AutoCal

36585-Series Automatic VNA Calibrator

36585K Precision AutoCal, 70 kHz to 40 GHz, 2-port

36585V Precision AutoCal, 70 kHz to 70 GHz, 2-port



Anritsu

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DECLARATION OF CONFORMITY

Manufacturer's Name: ANRITSU COMPANY

Manufacturer's Address: Microwave Measurements Division
490 Jarvis Drive
Morgan Hill, CA 95037-2809
USA

declares that the product specified below:

Product Name: Precision AutoCal 36585-Series Automatic VNA Calibrator

Model Number: 3658X Series

conforms to the requirement of:

EMC Directive: 2004/108/EC
Low Voltage Directive: 2006/95/EC

Electromagnetic Compatibility: EN61326:2006

Emissions: EN55011: 2007 Group 1 Class A

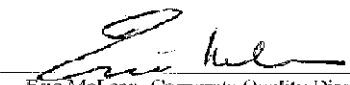
Immunity:

EN 61000-4-2:1995 +A1:1998 +A2:2001	4kV CD, 8kV AD
EN 61000-4-3:2006 +A1:2008	3V/m
EN 61000-4-4:2004	0.5kV SL, 1kV PL
EN 61000-4-5:2006	0.5kV L-L, 1kV L-E
EN 61000-4-6: 2007	3V
EN 61000-4-11: 2004	100% @ 20msec

Electrical Safety Requirement:

Product Safety: EN 61010-1:2001

Morgan Hill, CA


Eric McLean, Corporate Quality Director

27 Jan 2009
Date

European Contact: For Anritsu product EMC & LVD information, contact Anritsu LTD, Rutherford Close, Stevenage Herts, SG1 2EF UK, (FAX 44-1438-740202)

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部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 [Cr (VI)]	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷线路板 (PCA)	×	○	×	×	○	○
机壳、支架 (Chassis)	×	○	×	×	○	○
其他(电缆、风扇、连接器等) (Appended goods)	×	○	×	×	○	○

○：表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。
 ×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。

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注) 生产日期标于产品序号的前四码(如 S/N 0728XXXX 为 07 年第 28 周生产)。

Table of Contents

Chapter 1—General Information

1-1	Introduction	1-1
1-2	Purpose	1-1
1-3	Kit Contents	1-2

Chapter 2—Maintenance Instructions

2-1	Inspecting Connectors	2-1
2-2	Cleaning Connectors	2-1
2-3	Making the Connection	2-2
	Torque Specifications and Tools	2-2
2-4	Measuring Pin Depth	2-3
	Pin Depth Defined	2-3
	Required Equipment	2-4
	Checking the Gauge	2-4
	K Connector Measurement	2-5
	V Connector Measurement	2-5
	Tolerance/Gauge Settings	2-5

Chapter 1 — General Information

1-1 Introduction

This manual provides description and maintenance instructions for models 36585K (70 kHz to 40 GHz) and 36585V (70 kHz to 70 GHz) 2-Port AutoCal Calibration Kits. Part numbers and connector options are shown in the table below.

Use of the calibration kits and calibration procedures are documented in the VNA Operation Manual and Programming Guide.

1-2 Purpose

The calibration kits contain all of the precision components and tools required to calibrate an Anritsu Vector Network Analyzer System for a 12-term error-corrected measurement.

AutoCal has been characterized by Anritsu and the characterization file is included for use by the host VNA. It is valid for 1 year from time of shipment. The characterization cycle for the 36585-Series AutoCal is 12 months assuming proper use and care of the module and its connectors.

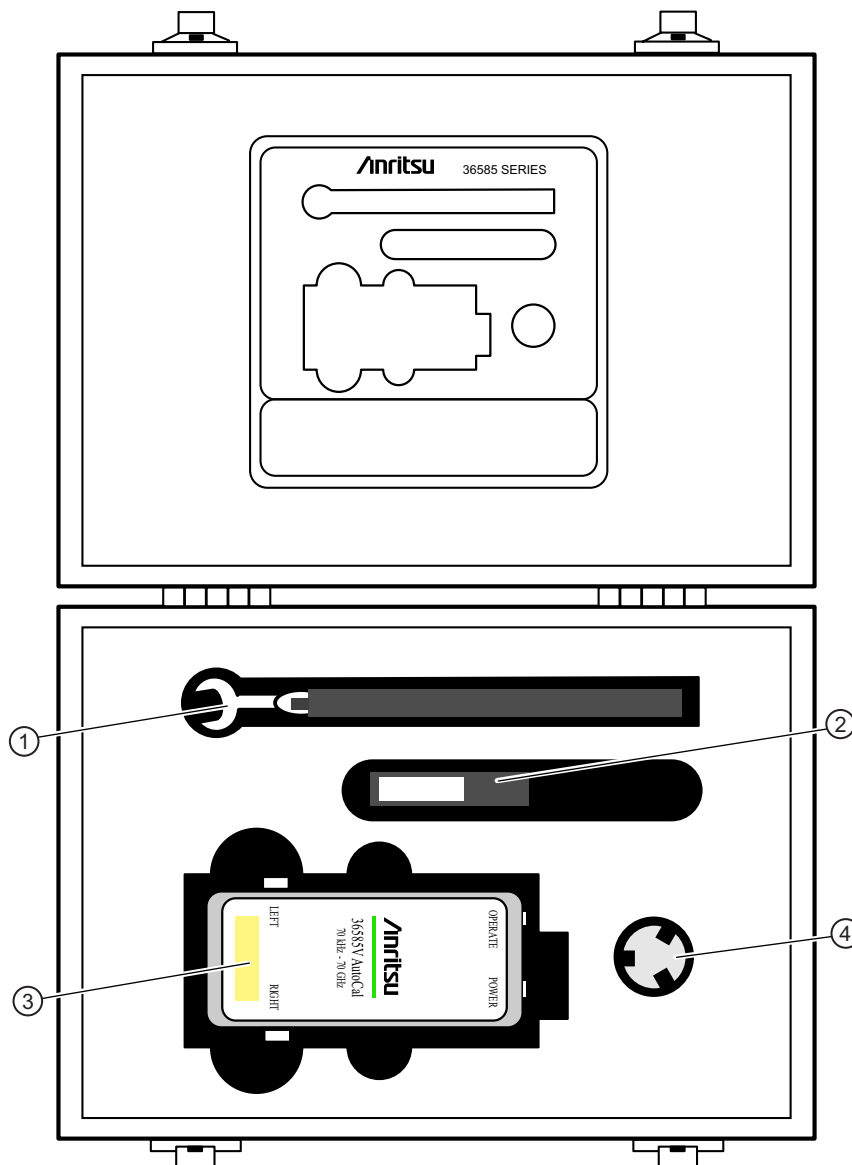
AutoCal can be characterized using the MS4640x Series VNA, following the instructions in the VNA Operation Manual. However, Anritsu can only guarantee meeting its published specifications with Anritsu-characterized AutoCals.

Table 1-1. 2-Port Precision AutoCal Models

Frequency Range	Connectors Type	Part Number
70 kHz to 40 GHz	K (male) to K (male)	36585K-2M
	K (female) to K (female)	36585K-2F
	K (male) to K (female)	36585K-2MF
70 kHz to 70 GHz	V (male) to V (male)	36585V-2M
	V (female) to V (female)	36585V-2F
	V (male) to K (female)	36585V-2MF

1-3 Kit Contents

The AutoCal 36585 Series Kit components are listed below.



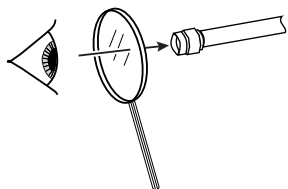
Index	Description
1	01-201 torque wrench, 8 mm, 0.9 N-m
2	Characterization data on a USB memory device
3	36585 precision AutoCal
4	01-204 universal wrench for K and V connectors
	Additional included items not shown in this figure: 40-187-R 12V Power Supply 806-69 Serial Cable Line Power Cord

Figure 1-1. Model 36585K, 36585V Calibration Kit Components

Chapter 2 — Maintenance Instructions

This chapter provides instructions on the care and use of precision connectors. It includes information on inspection, cleaning, pin depth measurement, and torquing instructions.

2-1 Inspecting Connectors

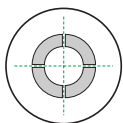


Use adequate magnification when inspecting connectors. The minimum magnification ranges from 2X to 10X magnification.

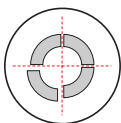
- K (2.92 mm) connectors: 7X
- V (1.85 mm) connectors: 7X



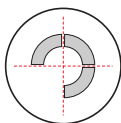
Normal



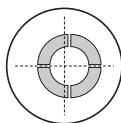
Bent



Broken



Nonconcentric



Inspect connectors for:

- Bent and missaligned center pins (pins should be concentric)
- Flaking or blistering plating
- Thread defects and deep scratches and dents on mating surfaces

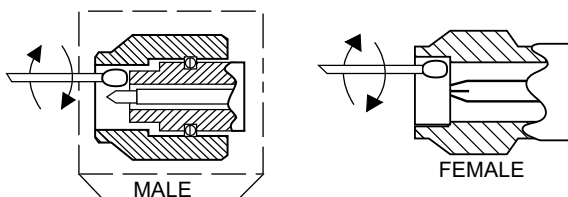
Discard and replace any connectors with any of the above defects.

2-2 Cleaning Connectors



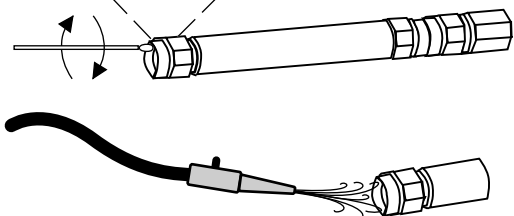
Keep connectors clean and free of dirt and other debris.

1. Blow out any debris from the connector using low-pressure, clean, dry, compressed air.
2. Apply a small amount of Isopropyl Alcohol (IPA) to a lint-free cotton swab.
3. Rotate the cotton swab around the connector, avoiding lateral pressure.
4. Blow out any remaining debris.
5. Inspect connector under magnification.



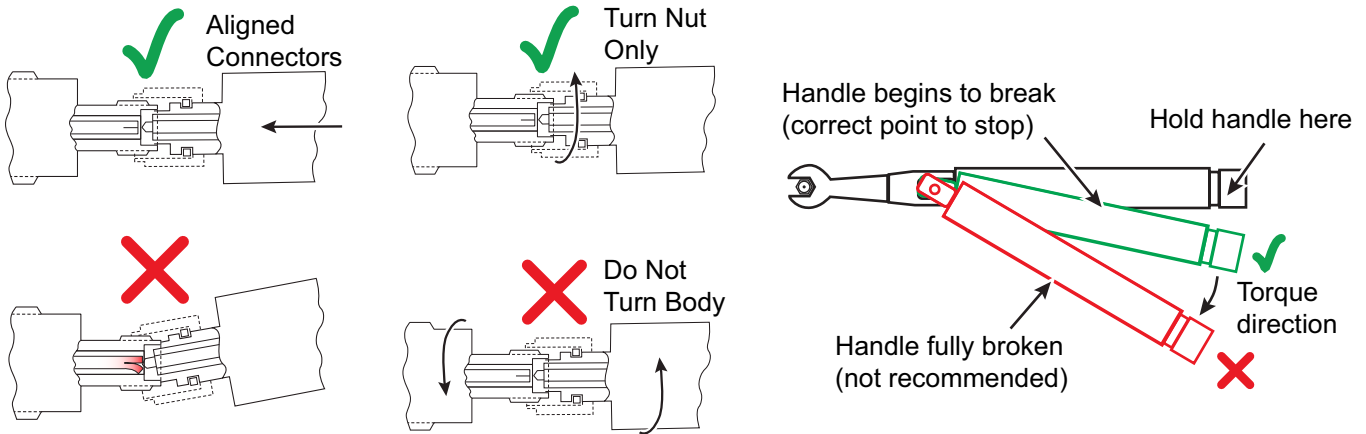
Notes: Most cotton swabs are too large to fit into the ends of the smaller connector types. In this case, peel off most of the cotton and then twist the remaining cotton tight. Be sure that no cotton gets caught in the connector.

Do not use industrial solvents or water to clean the connector. Use isopropyl alcohol only. **Do not** spray alcohol directly onto connector surfaces.



Teflon Tuning Washers: The center conductor on some RF components contains a small tefton tuning washer located near the point of mating (interface). Be careful not to disturb the tefton tuning washer during cleaning.

2-3 Making the Connection



Carefully align the connectors so they are parallel to each other. The male connector center pin must slip concentrically into the contact fingers of the female connector.

Never apply excessive force and **do not** twist while pushing the connectors together.

Finger-tighten the connection first by turning the connector nut. **Do not** turn the connector body.

The final tightening is done using the appropriate torque wrench set to the correct torque setting for your connector.

Never use pliers to tighten connectors. For connectors with flats, use the appropriate torque wrench. For connectors without flats, such as some Type N connectors, finger-tight is sufficient.

Torque Specifications and Tools

Connector Type/Size	Wrench Size	Torque Setting	Recommended Tools
K (2.92 mm) V (1.85 mm)	8 mm 5/16 in.	0.9 N·m 8 lbf·in	01-201 5/16 in. Torque Wrench 01-204 5/16 in. 8 mm Wrench

2-4 Measuring Pin Depth

Destructive pin depth of mating connectors is the most frequent cause of equipment failure in the field. When an RF component is mated with a connector having a destructive pin depth, damage will likely occur to the RF component connector.

A connector should be checked a minimum of once per day before use. Check the pin depth of a new connector or a connector of unknown quality to determine if it is out of specification. If the connector is to be used on equipment with unknown connector condition, the connector on the equipment should also be gauged.

For specific information on setting pin depths on sliding terminations, refer to the Vector Network Analyzer Operation Manual.

Pin Depth Defined

Pin depth is measured from a connector reference plane to a defined point on the connector center pin (depending on the connector type). A typical example of pin depth dimensions for a male and female connector is shown in the figure below.

The mechanical gauging of coaxial connectors will detect and prevent the following problems:

Positive Pin Depth: This can result in buckling of the fingers of the female center conductor or damage to the internal structure of a device due to the axial forces generated.

Negative Pin Depth: This can result in poor return loss, possibly unreliable connections, and even physical breakdown under peak power conditions.

Caution

Destructive pin depth means a center pin is too long with respect to the connector's reference plane. This can damage the mating connector.

Some RF components may not have precision type connectors. Mating a precision connector to a non-precision connector can result in connector damage or degraded performance.

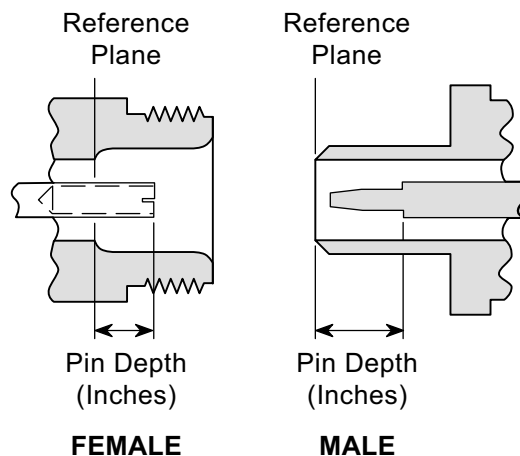


Figure 2-1. Pin Depth Example (N-Type Connector)

Required Equipment

Note Connector pin depth gauge kits are available as part of the Anritsu 365xX Series Calibration Kits. Refer to *Anritsu Precision RF & Microwave Components* catalog.

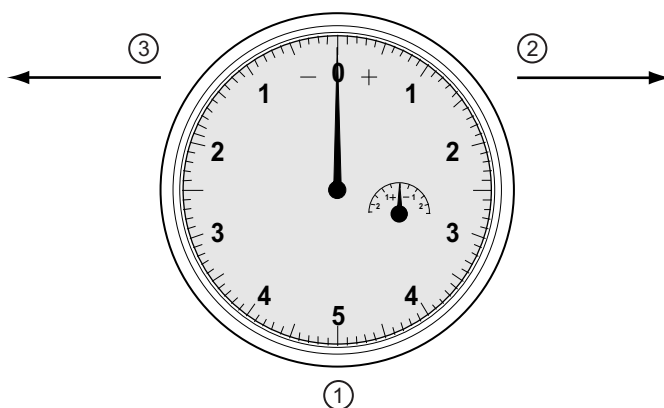
Pin Depth Gauge

Use an Anritsu Pin Depth Gauge or equivalent as shown below to accurately measure pin depths. [Table 2-1](#) lists the gauge and reference block part numbers according to connector type.

A typical pin depth gauge kit consists of the following items, depending on the type of connector you are measuring.

- Pin Depth Gauge
- Reference Block - for zeroing the gauge
- Adapters for connecting to a male or female connector

The gauge coupling nut and adapters will vary depending on the connector type.



Index	Description
1	Pin Depth Gauge with needle setting at zero.
2	Positive needle direction clockwise to right.
3	Negative needle direction counter-clockwise to left.

Figure 2-2. Pin Depth Gauge

Table 2-1. Pin Depth Gauge Parts by Connector Type

Connector Type	Gauge Part Number	Reference Block Part Number
K	01-222	01-210
V	01-322	01-210

Checking the Gauge

Pin depth gauges should be checked for cleanliness before each use. Follow the connector cleaning procedure to inspect and clean the pin depth gauge.

K Connector Measurement

1. On the pin depth gauge, loosen the side lock knob.
2. Remove the female adapter from the gauge body coupling nut.
3. Hold the reference block against the end of the gauge body and turn the gauge outer ring until the pointer rests on zero.
4. Tighten the side lock knob.
5. To measure female connectors, unscrew the gauge coupling nut and slide it forward.
6. To measure male connectors, leave the gauge coupling attached to the gauge body. Screw the female adapter to the coupling nut.

V Connector Measurement

1. On the pin depth gauge, loosen the side lock knob.
2. Hold the reference block against the end of the gauge body and turn the gauge outer ring until the pointer rests on zero.
3. Tighten the side lock knob.
4. To measure V male connectors, screw the female adapter onto the gauge coupling nut.
5. To measure V female connectors, screw the male adapter onto the gauge coupling nut.
6. Tolerance/Gauge Settings

Tolerance/Gauge Settings

Refer to [Table 2-2](#) below. When gauging pin depth, if the test device connector measures out of tolerance in the “+” region of the gauge, the center pin is too long. *Mating under this condition will likely damage the mating connector.*

On the other hand, if the test device connector measures out of tolerance in the “-” region, the center pin is too short. While this will not cause any damage, it may result in a poor connection and consequent degradation in performance.

Caution

The mating connectors of various RF components may not be precision types. Consequently, the center pins of these devices may not have the proper pin depth due to looser tolerances. The pin depth should be measured to ensure compatibility before attempting to mate it to a connector on Anritsu test equipment.

Table 2-2. Pin Depth Tolerances and Gauge Settings

Connector Type	Pin Depth (Inches)	Anritsu Gauge Setting
K Male	+0.000	Same as pin depth
K Female	-0.0050	
V Male	+0.000	Same as pin depth
V Female	-0.0040	

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