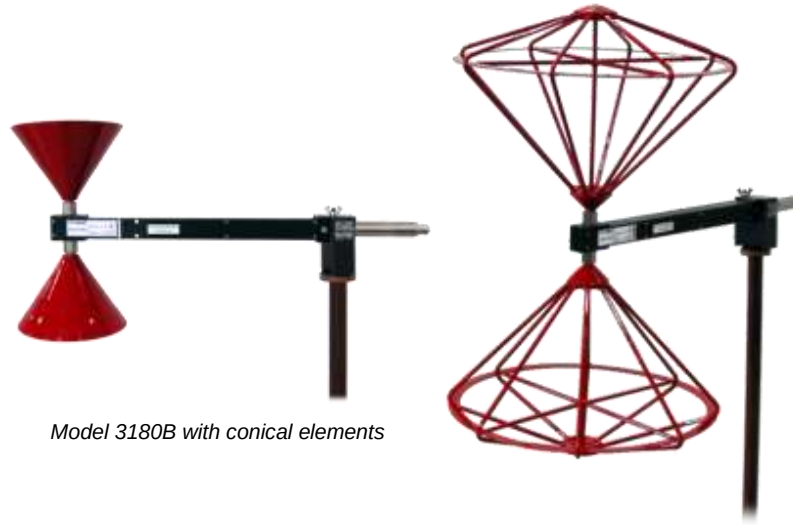


Model 3180B

Mini-Bicon Antenna

User Manual



Model 3180B with conical elements

Model 3180B with cage elements

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Notes, Cautions, and Warnings

	Note: Denotes helpful information intended to provide tips for better use of the product.
	Caution: Denotes a hazard. Failure to follow instructions could result in minor personal injury and/or property damage. Included text gives proper procedures.
	Warning: Denotes a hazard. Failure to follow instructions could result in SEVERE personal injury and/or property damage. Included text gives proper procedures.

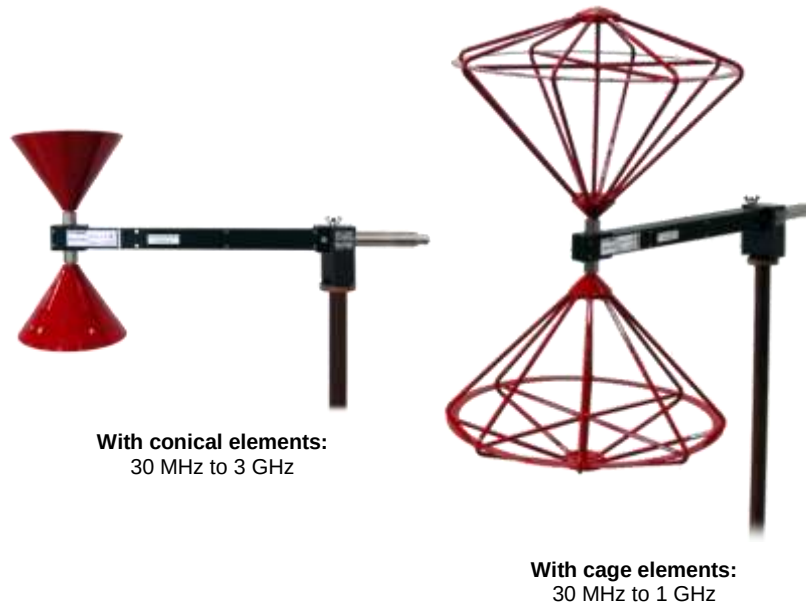


See the ETS-Lindgren *Product Information Bulletin* for safety, regulatory, and other product marking information.

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1.0 Introduction

The **ETS-Lindgren Model 3180B Mini-Bicon Antenna** is designed for optimal performance across a frequency range of 30 MHz to 1 GHz or 30 MHz to 3 GHz, depending on the elements:



The Model 3180B ships with both sets of elements. The uniquely-designed elements provide an omni-directional pattern without the main radiation beam splitting into two lobes in the elevation cut.

The Model 3180B is ideal for the Free Space NSA (FSNSA) test for fully anechoic rooms. The small size allows for harmonic monitoring when testing per IEC 61000-4-3.

In addition to covering the traditional frequency range EMC measurements, the Model 3180B covers all the VHF and part of the UHF bands, making it ideal for spectrum monitoring of FM, TV, and some cellular phones.

The Model 3180B is designed to have a radiation pattern that is omni-directional in the H-plane and maintains a single lobe in the E-plane across the range. The elements have been optimized to avoid splitting of the main radiation beam in the elevation cut.

The Model 3180B includes a stinger mount and standard mounting hardware. For the variety of mounting options available for the Model 3180B, see *Mounting Instructions* on page 23.

Tripod Options

ETS-Lindgren offers the following nonmetallic, non-reflective tripods for use at both indoor and outdoor EMC test sites.

- **4-TR Tripod**—Constructed of linen phenolic and delrin, designed with an adjustable center post for precise height adjustments. Maximum height is 2.0 m (80.0 in), and minimum height is 94 cm (37.0 in). This tripod can support up to an 11.8 kg (26.0 lb) load.



- **7-TR Tripod**—Constructed of PVC and fiberglass components, providing increased stability for physically large antennas. The unique design allows for quick assembly, disassembly, and convenient storage. Allows several different configurations, including options for manual or pneumatic polarization. Quick height adjustment and locking wheels provide ease of use during testing. Maximum height is 2.17 m (85.8 in), with a minimum height of 0.8 m (31.8 in). This tripod can support a 13.5 kg (30 lb) load.



ETS-Lindgren Product Information Bulletin

See the ETS-Lindgren *Product Information Bulletin* included with your shipment for the following:

- Warranty information
- Safety, regulatory, and other product marking information
- Steps to receive your shipment
- Steps to return a component for service
- ETS-Lindgren calibration service
- ETS-Lindgren contact information

2.0 Maintenance

CAUTION

Before performing any maintenance, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.



Maintenance of the Model 3180B is limited to external components such as cables or connectors.

If you have any questions concerning maintenance, contact ETS-Lindgren Customer Service.

Annual Calibration

See the *Product Information Bulletin* included with your shipment for information on ETS-Lindgren calibration services.

Replacement and Optional Parts



ETS-Lindgren may substitute a similar part or new part number with the same functionality for another part/part number. Contact ETS-Lindgren for questions about part numbers and ordering parts.

Following are the part numbers for ordering replacement or optional parts for the Model 3180B Mini-Bicon Antenna.

Part Description	Part Number
Clamp Block	102108
Support Base	101942B
Support Rod White	100733



For additional/optional mounting hardware, see *Additional Mounting Options* on page 23.

Service Procedures

For the steps to return a system or system component to ETS-Lindgren for service, see the *Product Information Bulletin* included with your shipment.

3.0 Specifications

Electrical Specifications

	Model 3180B, Conical Elements	Model 3180B, Cage Elements
Frequency Range:	30 MHz–3 GHz	30 MHz–1 GHz
VSWR Ratio (Average):	~5:1	~5:1
Maximum Continuous Power:	50 W	200 W
Impedance:	50 Ω	50 Ω
Connector:	Type N female	Type N female

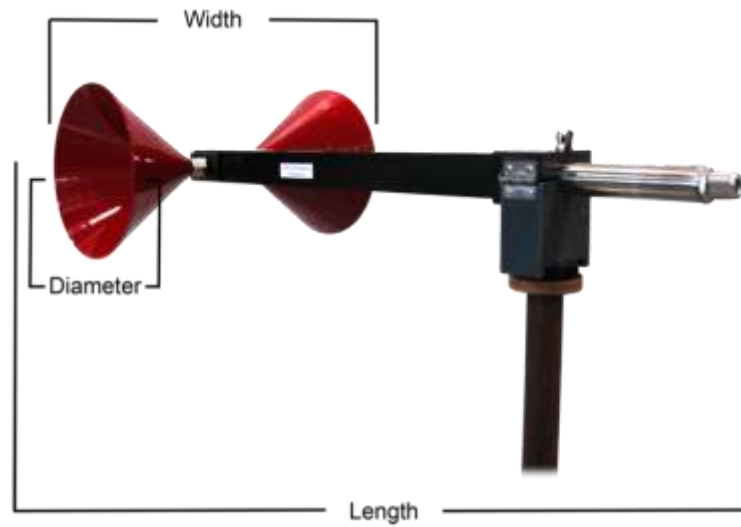
Physical Specifications

CONICAL ELEMENTS

	Model 3180B, Conical Elements
Width (Element, tip-to-tip):	30.0 cm 11.8 in
Length:	60.5 cm 23.8 in
Diameter:	16.5 cm 6.5 in



ETS-Lindgren recommends using a 6 dB pad attached to the end of the antenna; otherwise, high VSWR may occur.

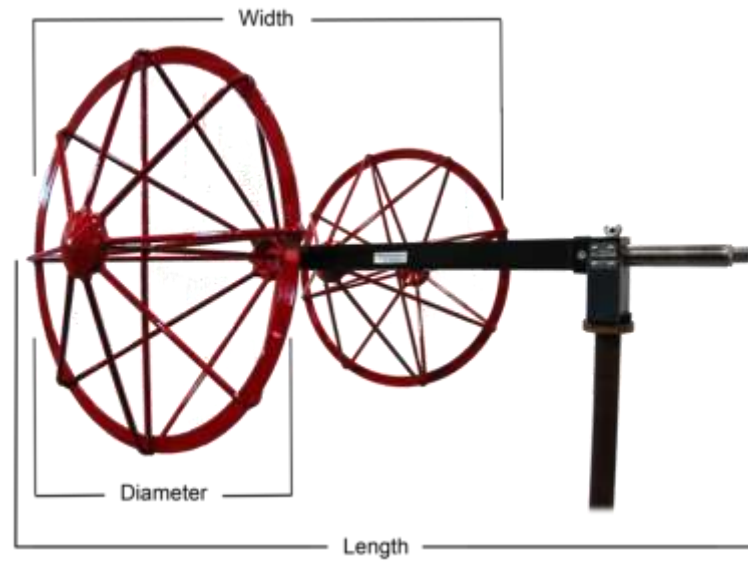


CAGE ELEMENTS

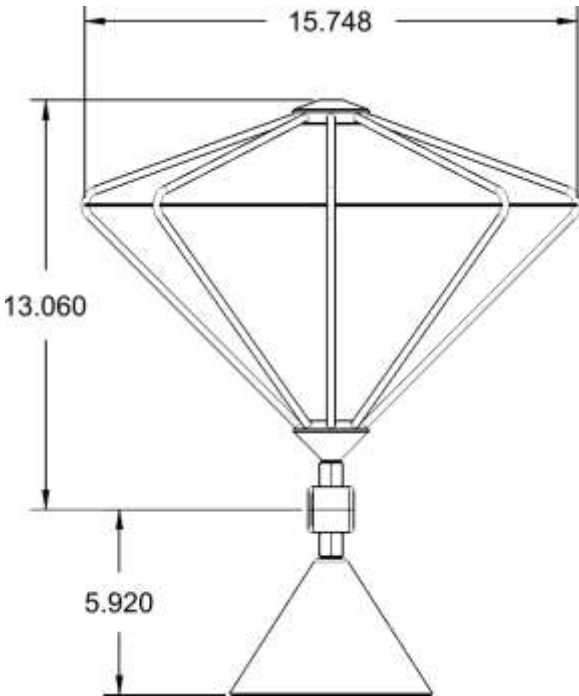
	Model 3180B, Cage Elements
Width (Element, tip-to-tip):	66.3 cm 26.1 in
Length:	72.2 cm 28.4 in
Diameter:	40.0 cm 15.7 in

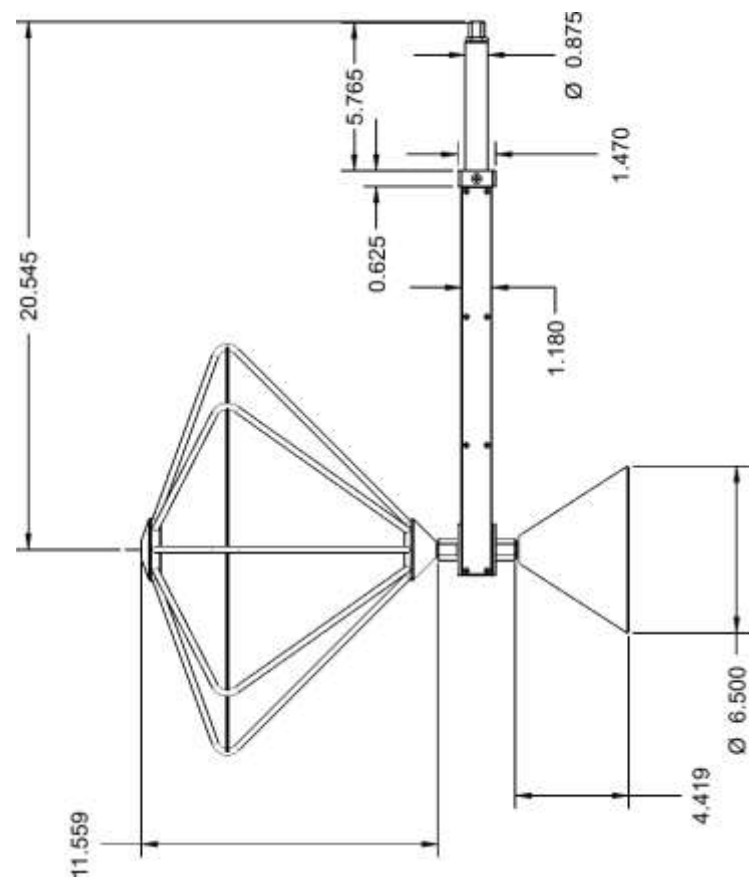


ETS-Lindgren recommends using a 6 dB pad attached to the end of the antenna; otherwise, high VSWR may occur.



Dimensional Drawings





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4.0 Assembly Instructions

CAUTION

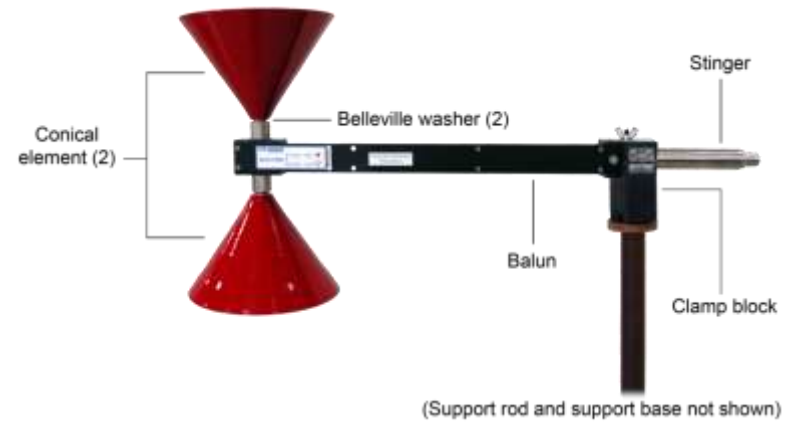
Before connecting any components, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.

Parts to Assemble

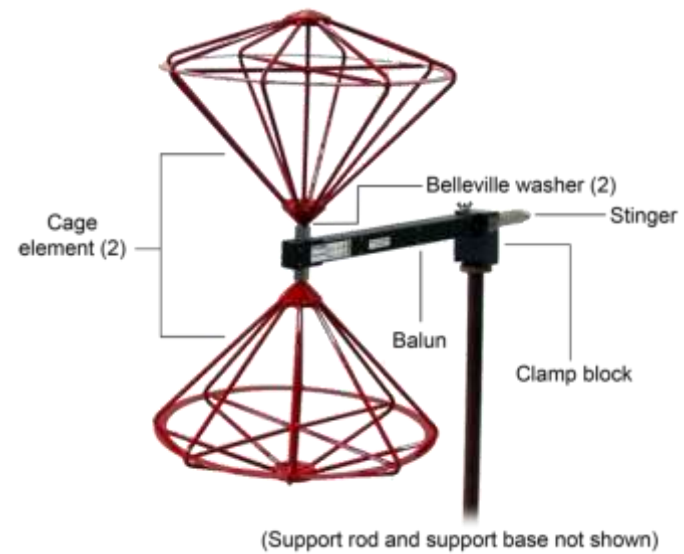
The Model 3180B Mini-Bicon Antenna is shipped unassembled, and includes these parts:

- Balun—includes attached stinger mount
- Element (2)
- Belleville washer (2)
- Clamp block
- Support rod and base

CONICAL ELEMENTS



CAGE ELEMENTS



Steps to Assemble

1. Slide a belleville washer onto the threaded screw end of one of the elements.
2. Line up the screw threads with the receptacle hole on the balun and turn the element until it is firmly secured in the balun.

CAUTION

Do not cross thread this connection or permanent damage to the joint could occur.

3. Repeat step 1 and step 2 using the remaining washer and element.

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5.0 Mounting Instructions

CAUTION

Before connecting any components, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.

CAUTION

The Model 3180B is a precision measurement device. Handle with care.



The following photos show the Model 3180B mounted onto a tripod with clamp block; support base and support rod not shown.



Using Included Mounting Adapters

The Model 3180B Mini-Bicon Antenna ships with these mounting adapters, used to mount the antenna to a 4-TR tripod:

- **102108 Clamp Block**—Uses standard 7/8–14 threads and comes with a 1/4–20 thread adapter for mounting to an ETS-Lindgren tripod or most other tripods.
- **100733 Support Rod**
- **101942B Support Base**



To use these adapters to mount the Model 3180B to a 4-TR tripod:

1. Assemble the clamp block, support base, and support rod, and attach the support base to the 4-TR tripod.
2. Unscrew the clamp block latch and open the top.
3. Insert the balun into the clamp block and close the top over the balun.
4. Move the latch to the closed position and tighten so the balun is held securely.
5. Attach the cable to the output connector on the antenna.

Using the Stinger Mount

The stinger on the Model 3180B enables you to mount to antenna directly to an ETS-Lindgren 7-TR Tripod Positioner.



Additional hardware is required to use the stinger to mount the Model 3180B to a mast. For information on ordering optional mounting hardware, contact the ETS-Lindgren Sales Department.

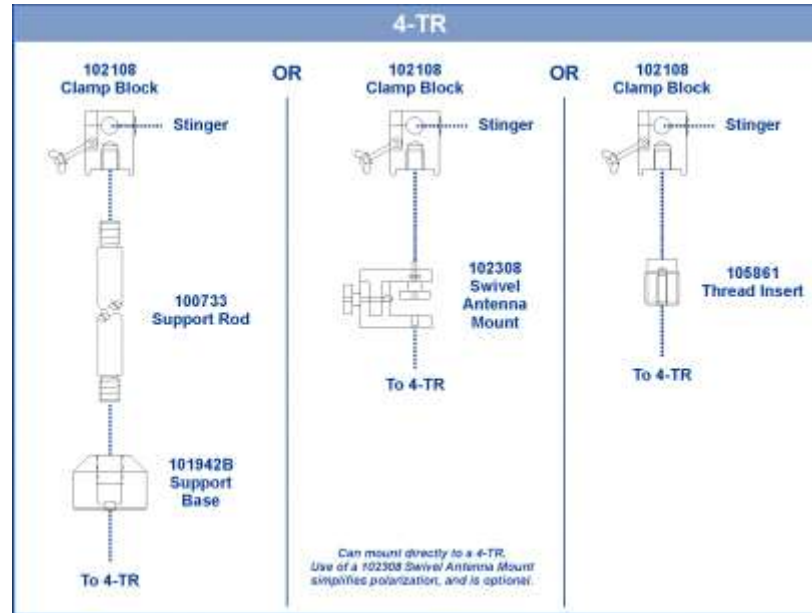


Do not use the stinger to mount the Model 3180B onto a 4-TR tripod.

Additional Mounting Options

4-TR MOUNTING OPTIONS

Following are additional options for mounting the Model 3180B onto an ETS-Lindgren 4-TR tripod. Contact the ETS-Lindgren Sales Department for information on ordering optional mounting hardware.



7-TR AND MAST MOUNTING OPTIONS

The stinger on the Model 3180B enables you to mount to antenna directly to an ETS-Lindgren 7-TR Tripod Positioner. Following are additional options for mounting the Model 3180B onto an ETS-Lindgren 7-TR Tripod Positioner.

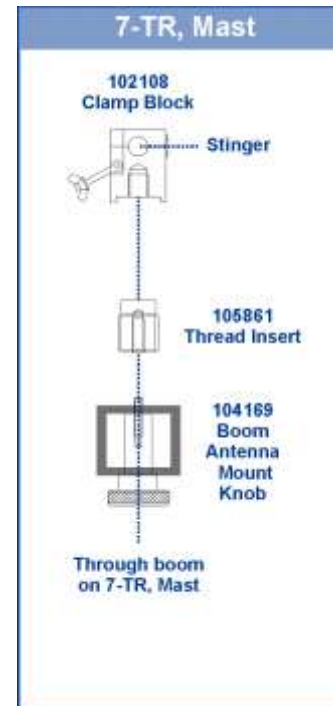
Contact the ETS-Lindgren Sales Department for information on ordering optional mounting hardware.



Mast refers to 2070 Series, 2075, and 2175 Antenna Towers.

7-TR refers to 109042, 108983, and 108507 booms:

- *109042 boom*—Straight boom; for general antenna mounting on a 7-TR
- *108983 boom*—Offset boom; for general antenna mounting on a 7-TR with pneumatic or manual polarization; can also be used to mount stinger-type antennas
- *108507 boom*—For Model 3106 Series antennas only; when changing polarization, maintains centerline rotation.

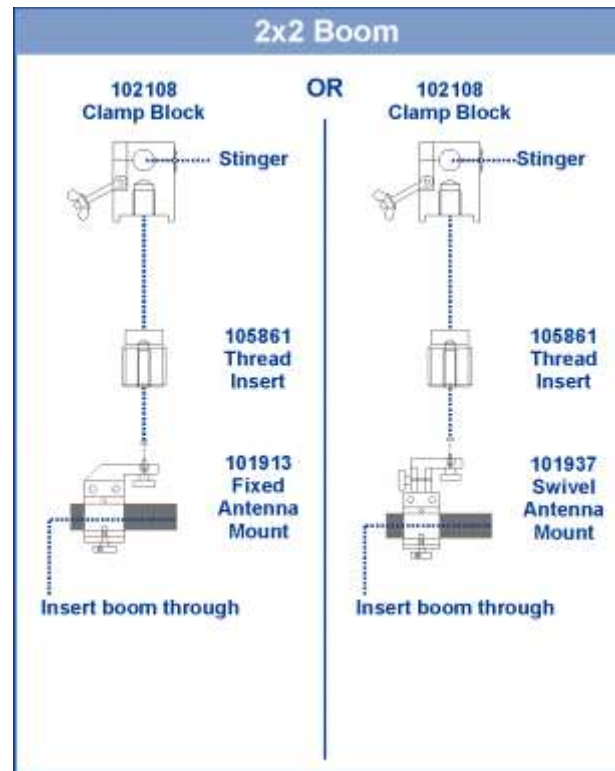


2x2 BOOM MOUNTING OPTIONS

Following are additional options for mounting the Model 3180B onto a 2x2 boom. Contact the ETS-Lindgren Sales Department for information on ordering optional mounting hardware.



2x2 boom refers to a typical 2-inch by 2-inch boom.



6.0 Application

The Model 3180B Mini-Bicon Antenna is ideally suited for swept site attenuation measurements per ANSI and FCC specifications. The Model 3180B can be used for horizontal and vertical site attenuation measurements. A 20 dB pre-amplifier is recommended in line with the receive antenna to minimize the required transmitted power and to reduce the possibility of saturation of the transmitting antenna. The maximum continuous input power for the Model 3180B is 50 W when using the conical elements (because of the higher VSWR at the lower end of the range) and 200W when using the cage elements.

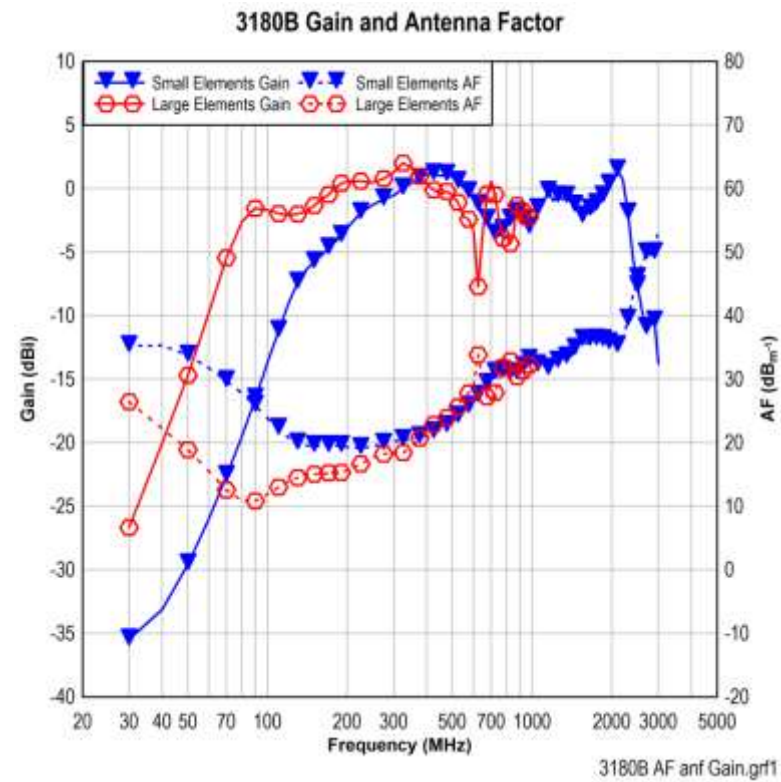
Each antenna is calibrated during manufacturing. The results of the calibration are tabulated as gain and antenna factor vs. frequency for use in Specification Compliance Testing. Typical data for the Model 3180B is provided in the next section.

The Model 3180B is also ideal to measure the amplifier harmonics during immunity testing per IEC61000-4-3. The antenna is placed at the location of the immunity plane and the output is connected to a spectrum analyzer. The rest of the test set up is left exactly as-is during the normal immunity test. In this way the level of the harmonics measured take into account the antenna, chamber, and amplifier.

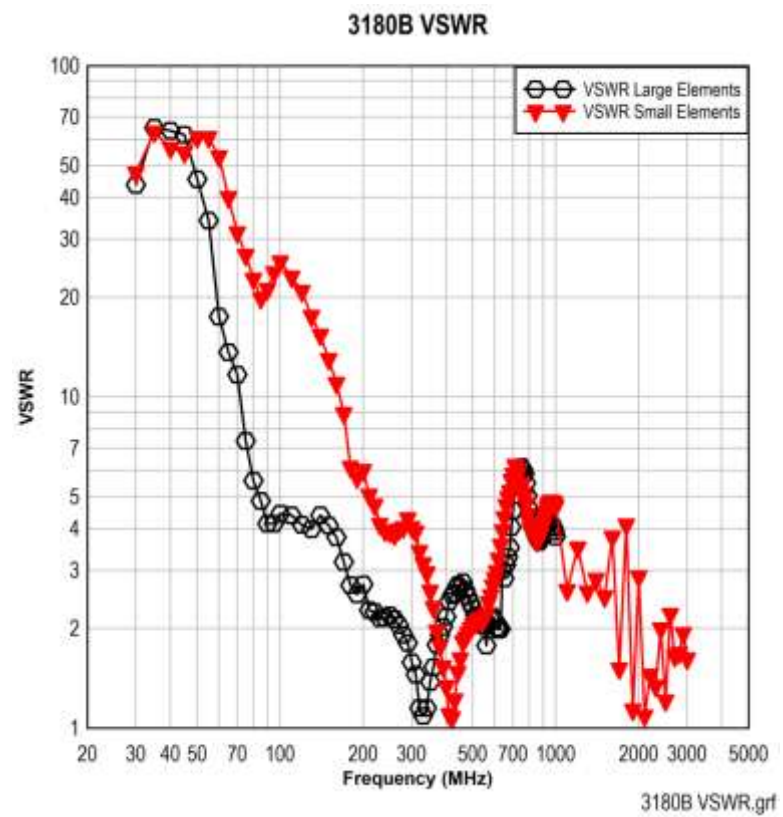
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7.0 Typical Data

Typical Gain and Antenna Factor—Both Elements

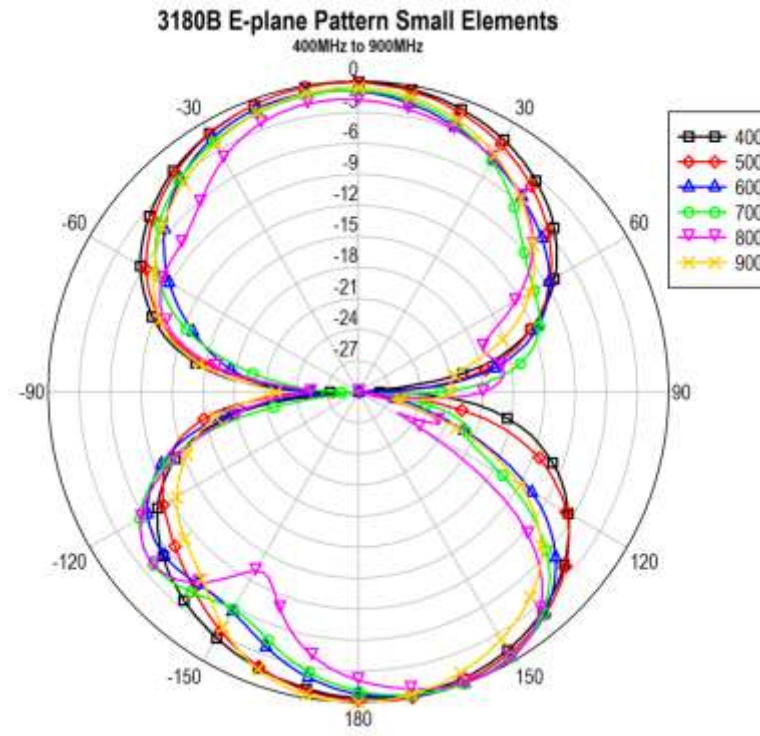


Typical VSWR—Both Elements

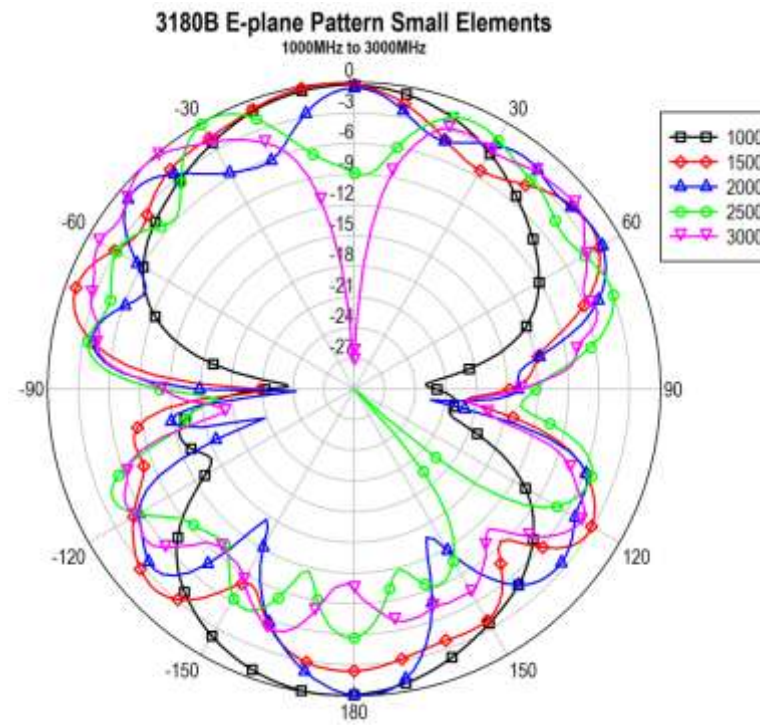


Typical Radiation Patterns

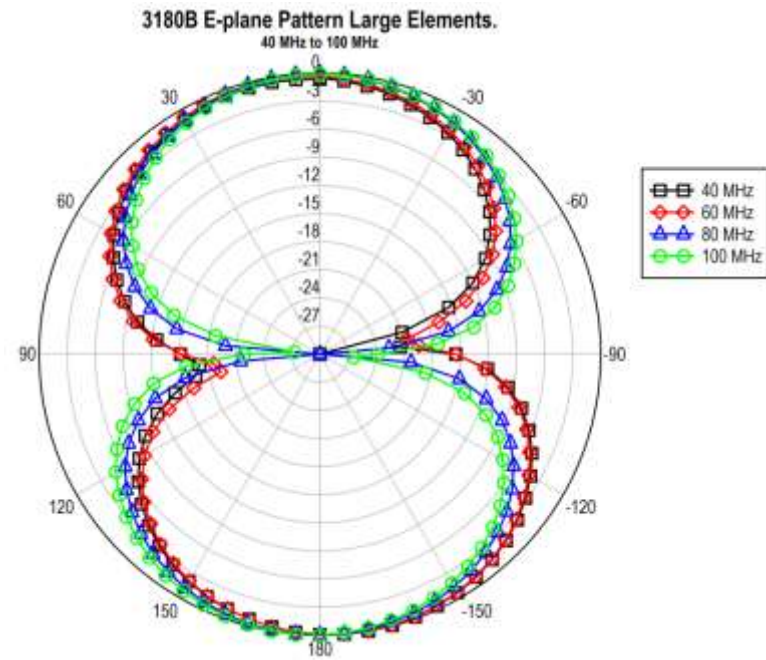
MODEL 3180B, CONICAL ELEMENTS, 400 MHz–900 MHz



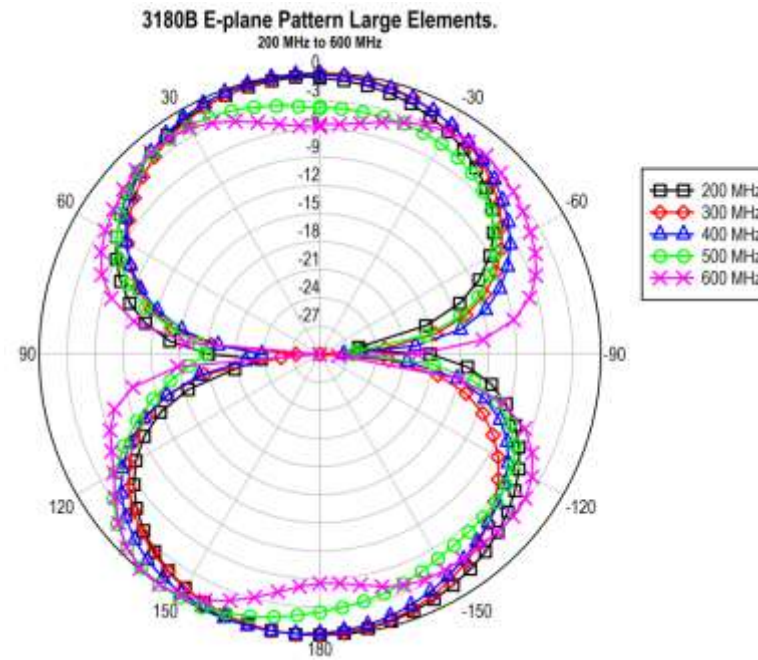
MODEL 3180B, CONICAL ELEMENTS, 1000 MHz–3000 MHz



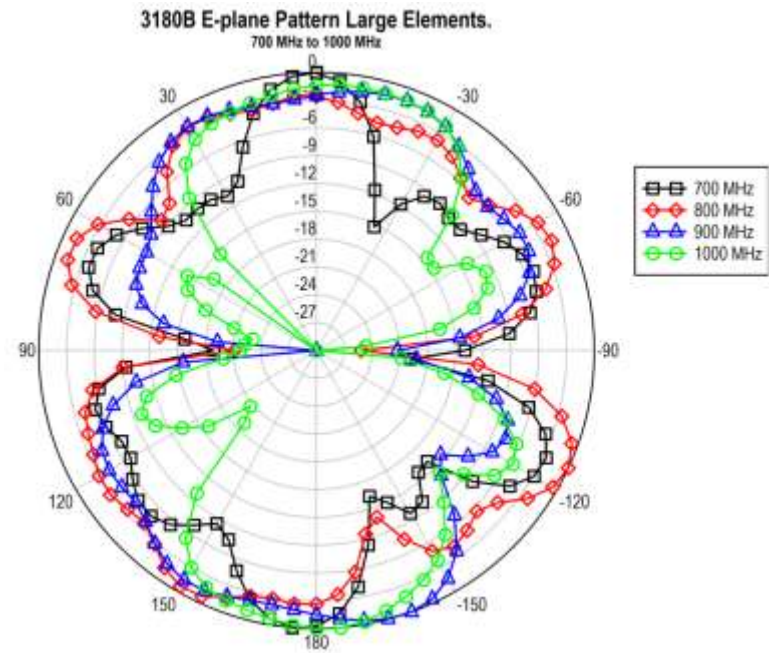
MODEL 3180B, CAGE ELEMENTS, 40 MHz–100 MHz



MODEL 3180B, CAGE ELEMENTS, 200 MHz–600 MHz



MODEL 3180B, CAGE ELEMENTS, 700 MHz–1000 MHz



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Appendix A: Warranty



See the *Product Information Bulletin* included with your shipment for the complete ETS-Lindgren warranty for your Model 3180B Mini-Bicon Antenna.

DURATION OF WARRANTIES FOR MODEL 3180B

All product warranties, except the warranty of title, and all remedies for warranty failures are limited to two years.

Product Warranted	Duration of Warranty Period
Model 3180B Mini-Bicon Antenna	2 Years