

Frequently Asked Questions about Power Splitters & Dividers. . .

What Types of power splitters and dividers does Weinschel offer?

Weinschel offers a variety of broadband (dc-40 GHz) resistive power splitters and dividers with Type N, SMA, 3.5mm, 2.92mm connector options. Power Dividers are available in 2 and 4 way configurations.

How does a resistive power splitter work?

Our resistive power splitters are intended for applications in which one of the two outputs are included in a leveling loop or used as a reference in a ratio measurement system, for the purpose of providing an output signal whose source impedance is essentially matched to 50 ohms. A basic design consists of three ports with a resistor on each of the two output ports, and is a unidirectional device.

What are some applications for a resistive power splitter?

Resistive power splitters provide exceptional amplitude tracking and a very low equivalent output SWR over very broad frequency ranges. They are used in applications in which one of the two outputs is included in a leveling loop or as a reference in a ratio systems such as:

- /// A dual channel insertion loss measuring system where the resistive power splitter provides reference and a signal channel.
- /// A precision power source where a power meter of known characteristics is used, either by ratio or leveling to provide a calibrated output.
- /// Provide a sampled output used for leveling a signal source - for instance in single channel attenuation measurements.

What applications use resistive power dividers?

- /// Broadband independent signal sampling - used in systems to simultaneously measure two different characteristics of one signal such as frequency and power.
- /// Distribution of a low power signals to two or more antennas.
- /// Laboratory measurements where a reference signal exactly tracking the reference signal is required.
- /// Resistive power dividers can be used as power combiners because they are bidirectional.

When do I use a power splitter or divider?

In simple terms many are confused as to the difference between power splitters and power dividers. Here is some basic information that we hope will help.

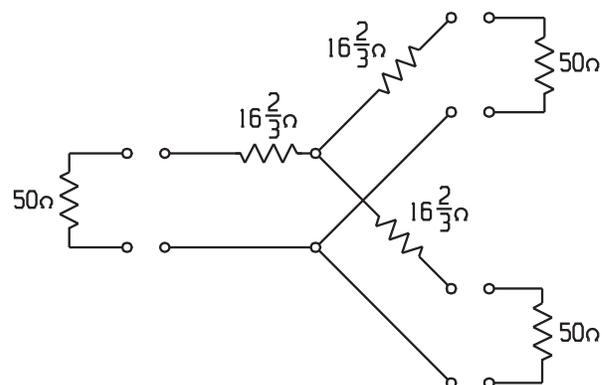
Power splitters are only used in a ratio systems or leveling loop.

- /// Power splitters can never be used to combined power. They are unidirectional.
- /// A basic power splitter has two resistors and three ports. Power dividers should not be used in ratio and leveling loop application because a mismatch condition of nominally 3:1 would exist.
- /// Power dividers can be used as power combiners because they are bi-directional. Power dividers can be used in a system to simultaneously measure different characteristics of one signal such as frequency and attenuation, power splitters can not.
- /// A basic power divider has three resistors and three ports. A simple description of the circuit shows that any one of the three ports has 50 ohm input impedance when the others are terminated in 50 ohms. The insertion loss between any two ports is 6 dB.



What is a Resistive Power Divider?

An equivalent circuit of the resistive divider is shown below. A simple analysis of this circuit will demonstrate that any one of the three ports has a 50 ohm input impedance when the other two are terminated in 50 ohms, and that the insertion loss between any two ports is 6 dB. A microwave network of this type consists of a symmetrical resistive film deposited on a ceramic substrate having three conducting contacts, each connected to the center conductor of a coaxial connector. Resistive dividers provide well-matched signals of essentially equal magnitude and phase over a very broad band as opposed to the reactive and hybrid types which employ frequency limitive techniques. The resistive divider is intended for applications where the output signals are used independently, such as the



Model 1550A Model 1594 4-WAY Resistive Power Dividers

Subminiature, SMA/3.5mm Connectors



Features

- /// **Broadband Performance.**
- /// **Excellent Tracking Between Ports.**
- /// **Miniature Size and Light Weight.**
- /// **Wireless Applications** - Model 1550A is specifically designed for use in the wireless communications bands.

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: 1550A: dc to 3.0 GHz (usable to 5 GHz)
 1594: dc to 18.0 GHz

INSERTION LOSS*:

Model 1550A: 12 dB nominal, 13.5 dB maximum
 Model 1594: 12 dB nominal, 14.5 dB maximum
 * input port to any output port with all other terminated.

MAXIMUM INPUT POWER: 1550A: 1 watt CW
 1594: 2 watts CW

AMPLITUDE & PHASE TRACKING (Maximum):

Model No.	Frequency (GHz)	Tracking*	
		Amplitude	Phase
1550A	dc - 3	±0.5 dB	±10°
1594	dc - 12	<2.0 dB	<30°
	12 - 18	<2.5 dB	<50°

*Between output ports.

NUMBER OF PORTS: 1 input and 4 outputs

TEMPERATURE RANGE: -55°C to +100°C

CONNECTORS: Model 1550A: SMA female connectors all ports--mate nondestructively with other SMA, 2.92mm and 3.5mm connectors.

Model 1594: 3.5mm female connectors all ports--mate non-destructively with other SMA, 2.92mm and 3.5mm connectors.

dc to 3.0 GHz/1 Watt
 dc to 18.0 GHz/2 Watts

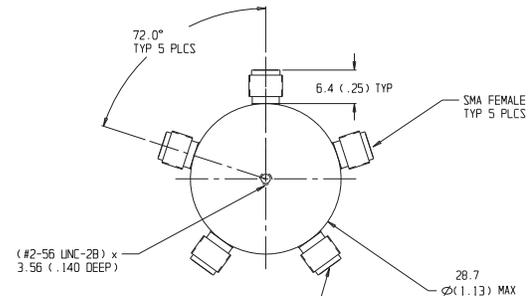
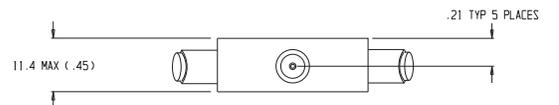
MAXIMUM SWR:

Model No.	SWR
1550A	1.25
1594	1.30

WEIGHT: 1550A: 28 g (1.0 oz) maximum
 1594: 30 g (1.05 oz) maximum

PHYSICAL DIMENSIONS:

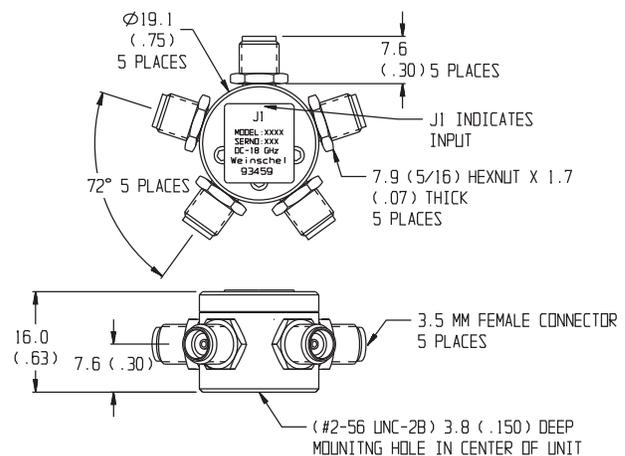
Model 1550A:



CAUTION:

TORQUE ON CONNECTORS NOT TO EXCEED 7 TO 10 INCH POUNDS (PER MIL-C-39012). THESE CONNECTORS ARE PRESS FIT. EXCEEDING THIS MAY CAUSE CONNECTOR TO COME LOOSE

Model 1594:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Coaxial Adapters



- /// High Repeatability & Low SWR
- /// Rugged Injection Molded Connectors.
- /// Bulkhead Mounting - Model 1568 conveniently mounts on any panel using a standard D-hole.
- /// In-Series & Between Series Configurations - Type N or SMA
- /// Precision Connectors & Rugged Construction

General Information

In this section of the catalog, each product is outlined utilizing individual data sheets containing product features, specifications, and outline drawings. These data sheets are preceded by a quick reference guide to help you select the product(s) that fits your needs. The page number for each product data sheet is given in the quick reference guide.

The superior performance Aeroflex / Weinschel components enjoy is due to our connector design capabilities. Utilizing proprietary design techniques, we offer connectorized devices that are mechanically robust, stable over environmental extremes, and highly reliable. Aeroflex / Weinschel offers a comprehensive line of between-series adapters, blind-mate connectors, and our patented PLANAR CROWN® Connector System.

NOTE: *EXPRESS* Shipment available via www.argosysales.com or 800-542-4457. Check with distributor for current products and stocking quantities.



Precision Adapters...dc-26.5 GHz

MODEL NUMBER	CONNECTOR TYPE	FREQUENCY RANGE	SWR (MAXIMUM)	INSERTION LOSS	REPEATABILITY	Page No.	
<ul style="list-style-type: none"> ★ F1513 ★ M1513 	N female - N female N male - N male	dc - 18	1.10-1.15*	<0.25	0.020 dB	234	
<ul style="list-style-type: none"> ★ 1548-13 1548-14 1548-23 ★ 1548-24 	SMA female - N female SMA female - N male SMA male - N female SMA male - N male	dc - 18	1.10	0.43 (maximum) per mated pair	Type N: 0.006-0.010* SMA: 0.010-0.020*	236	
<ul style="list-style-type: none"> ★ 1568 ★ 1568-1 	SMA (female-female) bulkhead (add -1 to model number for stainless steel)	dc - 26.5	1.15-1.20*	<0.30 - <0.50*	0.010-0.020*	232	
<ul style="list-style-type: none"> ★ 1587 ★ 1588 ★ 1589 	SMA female - SMA female SMA male - SMA female SMA male - SMA male	dc - 26.5	1.15-1.20*	<0.30 - <0.50*	0.010-0.020*	233	
<ul style="list-style-type: none"> ★ 7002-13 ★ 7002-14 ★ 7002-23 ★ 7002-24 	SMA female to N female SMA female to N male SMA male to N female SMA male to N male	dc - 18	1.12	<0.40 - <0.50*	0.010-0.020*	235	

★ EXPRESS Shipment available via www.argosysales.com or 800-542-4457.
Note: Other models may also be available from Express delivery.

* VARIES WITH FREQUENCY

Frequently Asked Questions about Adapters Precision Connector Systems...

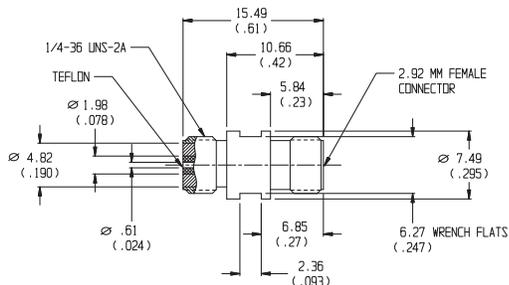
What types of adapters and/or connectors does Aeroflex / Weinschel offer?

Aeroflex / Weinschel offers a wide variety of precision SMA, 2.92mm, Type N, 3.5mm, 2.4mm and male, female, and sexless combinations of adapters from which to choose. Also, Aeroflex / Weinschel manufactures a wide range of Blind-mate Connectors and our own PLANAR CROWN® Connector System. All Aeroflex / Weinschel components are designed and manufactured to obtain low SWR and excellent repeatability over the longest possible operational life. Other features of Aeroflex / Weinschel Adapters and Connectors include:

1. High Repeatability.
2. Quality Connectors - SMA, Type N, 3.5mm, 2.92mm, and 2.4mm.
3. Bulkhead Mounting Available
4. Broad Frequency Range - dc to 40 GHz.

What are Blind-mate Connectors and where would I use them?

Aeroflex / Weinschel Blind-mate connector series provides threadless connector mating which is useful when mating an array of connectors on one RF module to another array within seconds. Each connector pair will tolerate a radial and axial offset of 0.02 inch and still meet all of its electrical specifications. These connectors simplify RF connections in the most inaccessible regions and high package density systems where conventional threaded connector mating is extremely difficult.

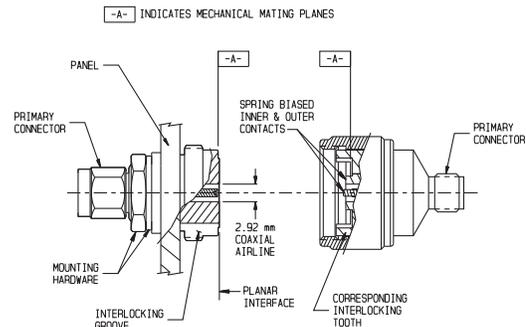


What is difference between Aeroflex / Weinschel precision SMA/ 2.92mm connectors and other SMA connectors?

Typical commercial SMA connectors may have a useful SWR to 18 or 26 GHz; however, most absorb energy between 22 and 25 GHz due to TEM mode conversion. A mated pair could have between 0.5 dB to 2.0 dB insertion loss. A mated pair of Aeroflex / Weinschel Precision Miniature connectors (2.92mm), which mate with SMA type connectors, have a VSWR of less than 1.25 and an insertion loss of less than 0.5 dB to 26 GHz. The new 2.92mm expands this range to 40 GHz.



What is the advantages of using Aeroflex / Weinschel PLANAR CROWN® connectors?.



The Aeroflex / Weinschel PLANAR CROWN® Universal Connector System incorporates design and application features that eliminate the mechanical, electrical and economical drawbacks of standard bulkhead connectors, connector savers, cable connectors and adapters. In one standard design, it has resolved connector related problems faced by users and manufacturers of instruments, cables and components, how to quickly and inexpensive to change connector series or replace damaged front panel connectors on instruments. This system features an operating frequency range of dc to 40 GHz; ability to maintain calibration integrity when changing connector types; and compatibility with all Type N, TNC, GPC-7, SMA, 2.92mm, and 2.4mm connectors used throughout the microwave industry.

What is a Ruggedized SMA Connector?

All Aeroflex / Weinschel SMA connectors labeled as ruggedized have a dielectric insulator at the interface of the connector to provide additional support for the center conductor during connects and disconnects and to keep out foreign material. This provides an important benefit-improved axial alignment of the center contact. This substantially reduces finger breakage of the female contact. Longevity of the Aeroflex / Weinschel SMA connector is enhanced because of the increased shoulder-wall thickness of the male connector shell. Typically, a standard SMA male connector shell has a 0.0065 inch wide shoulder. Compare that to 0.018 inch for the Aeroflex / Weinschel SMA series. The shoulder of most SMA male connectors gradually collapses from use. This causes the center contact to exceed the maximum height tolerance and eventually destroys the mating female contact. This will not happen with a Aeroflex / Weinschel SMA connector.

Model 1568 & 1568-1 Precision Coaxial Panel Adapters

dc to 26.5 GHz

Ruggedized SMA Connectors (female to female)



TEMPERATURE RANGE: -55°C to +125°C

CONSTRUCTION: Inner and outer conductors: heat treated beryllium copper, gold plated. Mounting hardware provided (Hex nut and lockwasher) Add -1 to model number for the optional stainless steel body.

CONNECTORS: SMA connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.

WEIGHT: 56.7 g (2 oz) maximum

PHYSICAL DIMENSIONS:

Features

- /// **High Repeatability.**
- /// **Rugged Injection Molded Connectors.**
- /// **Bulkhead Mounting** - Conveniently mounts on any panel using a D-hole shown below. Extra heavy construction for long life even with mistreatment makes this adapter suitable for instrument and subsystem front panel applications.

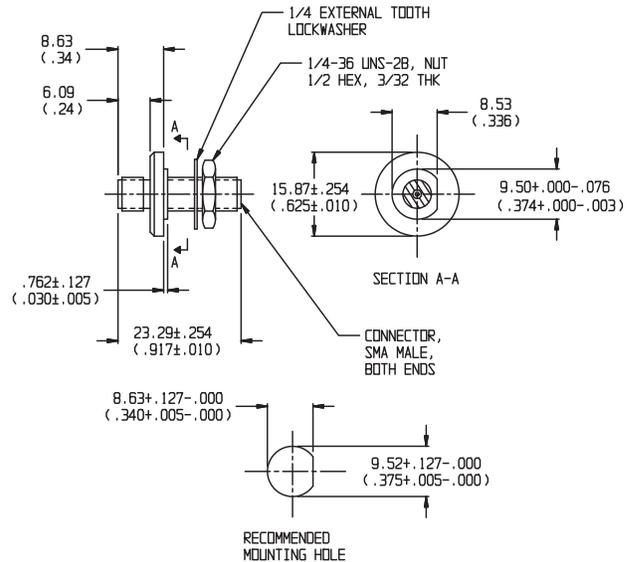
Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 26.5 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 18	1.15
18 - 26.5	1.20

INSERTION LOSS & REPEATABILITY (dB):		
Frequency (GHz)	Ins Loss	Repeatability
dc - 12.4	< 0.30	0.01
12.4 - 18	< 0.40	0.02
18.0 to 26.5	< 0.50	0.02



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Coaxial Adapters



Models 1587, 1588 & 1589 Precision Coaxial Adapters

dc to 26.5 GHz

Ruggedized SMA to SMA Connectors



Features

- /// High Repeatability.
- /// Rugged Injection Molded Connectors.
- /// Designed for Measurement System Use - Auxiliary wrench flats aid in torquing connections without "chain reaction" loosening of multiple component hookups.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 26.5 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 18	1.15
18 - 26.5	1.20

INSERTION LOSS & REPEATABILITY (dB):		
Frequency (GHz)	Ins Loss	Repeatability
dc - 12.4	< 0.30	0.01
12.4 - 18	< 0.40	0.02
18 to 26.5	< 0.50	0.02

TEMPERATURE RANGE: -55°C to +125°C

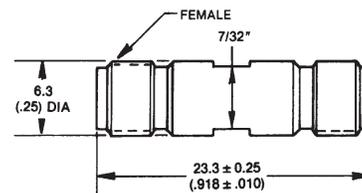
CONSTRUCTION: Inner and outer conductors: heat treated beryllium copper, gold plated.

CONNECTORS: SMA connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.

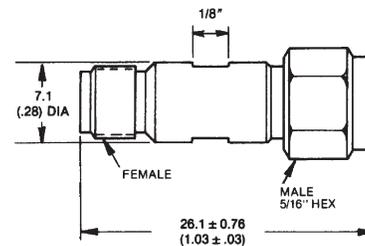
WEIGHT: 56.7 g (2 oz) maximum

PHYSICAL DIMENSIONS:

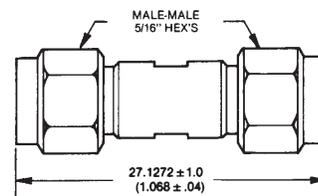
MODEL 1587:



MODEL 1588:



MODEL 1589:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model 1513 Precision Coaxial Adapter

dc to 18.0 GHz

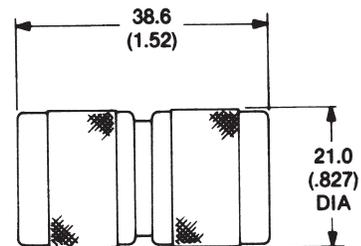
Type N to Type N



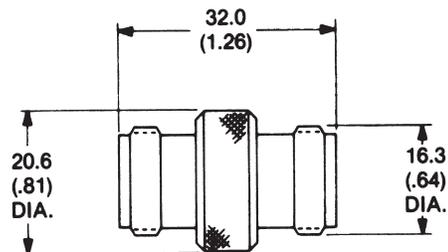
WEIGHT: Model M1513: 50 g (1.7 oz) maximum
Model F1513: 40 g (1.4 oz) maximum

PHYSICAL DIMENSIONS:

MODEL M1513:



MODEL F1513:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Features

- /// Low SWR.
- /// High Repeatability.
- /// Stainless Steel Construction.

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 18.0 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR
dc - 10	1.10
10 - 18	1.15

INSERTION LOSS & REPEATABILITY (dB):		
Frequency (GHz)	Maximum Ins Loss	Repeatability (Typical)
dc - 18	< 0.25	0.02

TEMPERATURE RANGE: -55°C to +85°C

CONSTRUCTION: Stainless Steel body, beryllium copper, gold plated contacts.

CONNECTORS: Type N per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors. Select model number as follows:

- Model M1513: male to male
- Model F1513: female to female

Model 7002 High Performance Coaxial Adapter

dc to 18.0 GHz

Ruggedized SMA to Type N Connectors



Features

- /// High Repeatability
- /// Rugged Injection Molded Connectors
- /// Stainless Steel Construction

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 18.0 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR (per adapter)
dc - 18	1.12

INSERTION LOSS & REPEATABILITY (dB):		
Frequency (GHz)	Ins Loss*	Repeatability*
dc - 12.4	< 0.40	0.01
12.4 - 18	< 0.50	0.02

*Specification based on mated pair terminated in 50 Ω.

ELECTRICAL LENGTH:

Models 7002-14 & 7002-24: 33mm

Models 7002-13 & 7002-23: 20mm

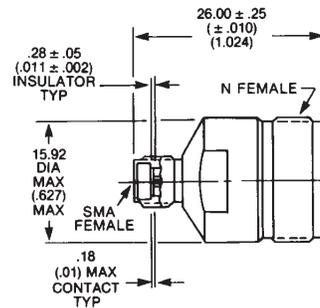
CONSTRUCTION: Gold plated beryllium copper center conductors, injection molded into stainless steel outer bodies.

CONNECTORS: Type N and SMA connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.

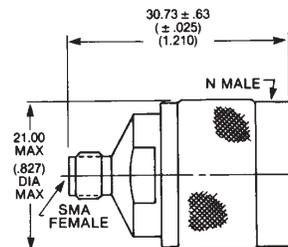
WEIGHT: 30 g (1.1 oz) maximum

PHYSICAL DIMENSIONS:

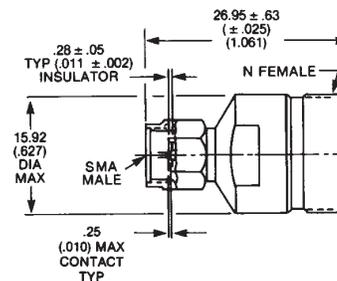
MODEL 7002-13:



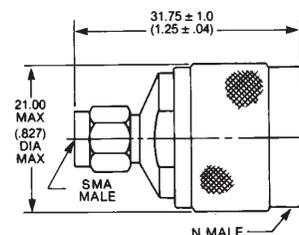
MODEL 7002-14:



MODEL 7002-23:



MODEL 7002-24:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model 1548 Precision Coaxial Adapter

dc to 18.0 GHz

SMA to Type N Connectors



Features

- /// High Repeatability
- /// Rugged Construction
- /// Stainless Steel Construction

Specifications

NOMINAL IMPEDANCE: 50 Ω

FREQUENCY RANGE: dc to 18.0 GHz

MAXIMUM SWR:	
Frequency (GHz)	SWR*
dc - 18	1.10

INSERTION LOSS (dB):	
Frequency (GHz)	Loss (maximum)*
dc - 18	<0.43

REPEATABILITY (dB):		
Frequency (GHz)	Type N	SMA
dc - 12.4	< 0.006	0.01
12.4 - 18	< 0.010	0.02

* Specification based on mated pair terminated in 50 Ω.

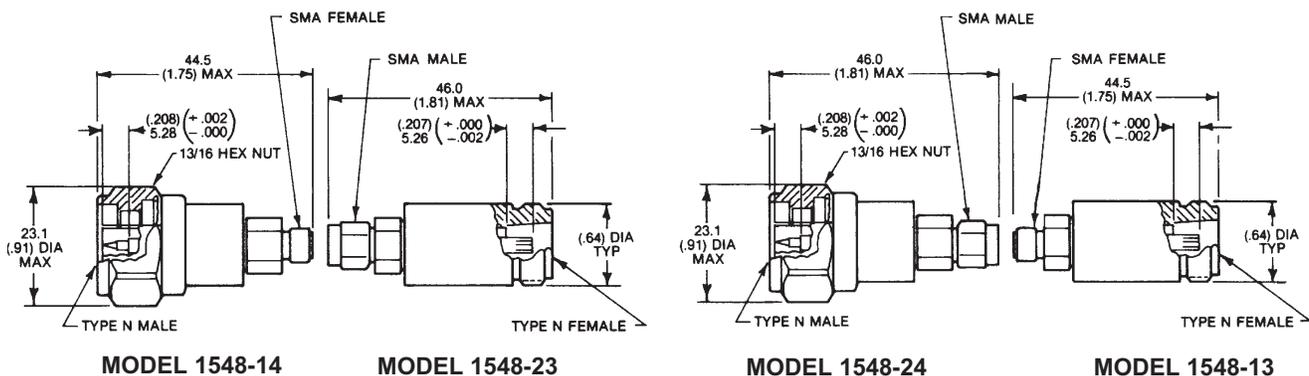
TEMPERATURE RANGE: -55°C to + 85°C

CONSTRUCTION: Stainless steel body and coupling nuts. Gold plated beryllium copper center conductors and SMA bodies, injection molded insulators. Coupling Torque: 14 ± 1 inch pounds for Type N and 8±0.5 inch pounds for SMA.

CONNECTORS: Type N and SMA connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.

WEIGHT: 56.7 g (2 oz) maximum connectors only.

PHYSICAL DIMENSIONS:



NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.