Maury Microwave

7mm Digital
Connector Gage Kit
Metrology Grade
Model A028F

User Guide

7mm Digital
Connector Gage Kit

Model A028F

Maury Microwave
2900 Inland Empire Boulevard
Ontario, California 91764-4804 USA
Phone: (909) 987-4715
Facsimile: (909) 987-1112

maurymw.com

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Maury Microwave hardware products are warranted against defects in materials and workmanship for a period of one year from date of shipment. During the warranty period, Maury Microwave will, at its option, either repair or replace products which prove to be defective.

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The remedies provided herein are the Buyer's sole and exclusive remedies. Maury Microwave shall not be liable for any direct, indirect, special, incidental, or consequential damages whatsoever (including, without limitation, damages for loss of business profits, business interruption, loss of business information, or any other financial loss) arising out of the Buyer's use of or inability to use the product, even if Maury or an authorized Maury dealer has been advised of the possibility of such damages.

Contents

General Information

Gage Kit Description

The Maury model A028F connector gage kit is designed to measure 7mm connectors with either female or male interfaces. The digital indicators used in the A028F connector gage kit provide a measurement resolution of .0001" when used in the inch mode or .001mm (0.000040 inches) when used in the metric mode. For simplicity, the rest of this manual will refer to measuring in inches. However, the principles presented apply equally when used in metric mode. The Maury A028F connector gage kit achieves excellent repeatability by maintaining tightly controlled tolerances on all machined parts.

The Maury model A028F1 measures 7mm connectors this gage assembly uses a "thread-on" design that simulates actual mating conditions, allowing high accuracy measurements and hands-free operation. The connector gage assemblies are initially set to zero using master setting gages, A028F1, permitting measurements to be read directly on the digital indicator. Centering sleeves are provided for measuring beadless air lines and mismatch air lines. Flush setting sliding loads is easily accomplished using the A028F1. The thread-on design of the A028F also allows more convenient and accurate measurements of network analyzer test ports.

Maury models A028F1 connector gages are compatible with Mitutoyo SPC Digimatic readouts for external display of data. Use Maury model A048B1 & A048B2 data cables. See **Figure 2**. All machined parts are made from heat treated stainless steel to assure long life and excellent stability. Gaging surfaces are lapped to ensure a high degree of accuracy. A parts list is shown in **Table 1**.

Item	Description	Maury Part Number	Quantity Per Assy.	Notes
1	Indicator Assembly	A028F1	1	—
4	Master Gage	A028D2	1	—
5	Sleeve Set (2)	A028S1	1	*
6	Aligning Pin	028-30	1	*
7	Torque Wrench, 3/4	2698C2	1	12 in/lbs
8	Open End Wrench, 1/2	2517S3	1	—
9	Battery	SR44**	(1)	Commercial
10	Data Cable (40 inch)	A048B1	(1)	(Optional)
11	Data Cable (80 inch)	A048B2	(1)	(Optional)

* The centering sleeves and aligning pin are shipped in small plastic containers

** 20,000 hour life.

Table 1. Parts List

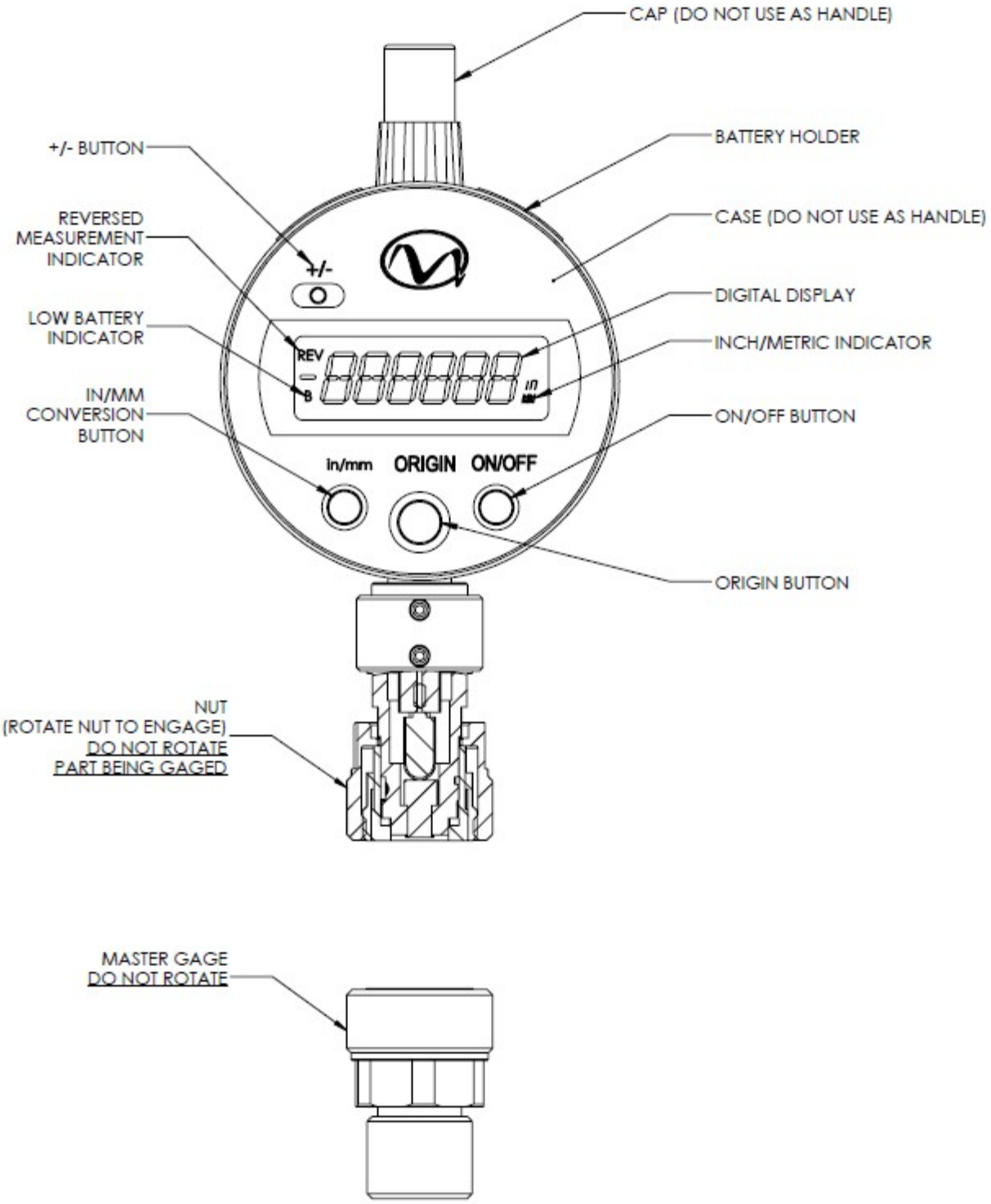
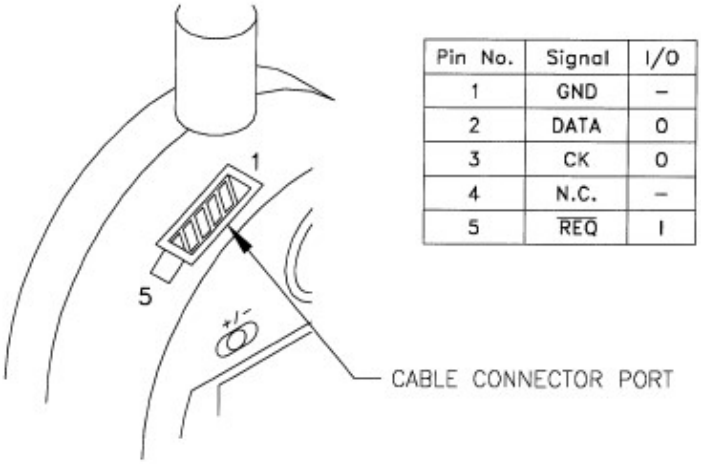
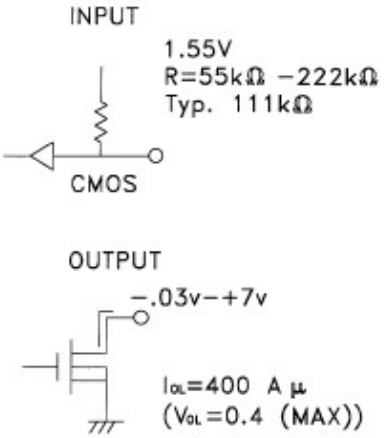


Figure 1. The A028F Connector Gage Kit

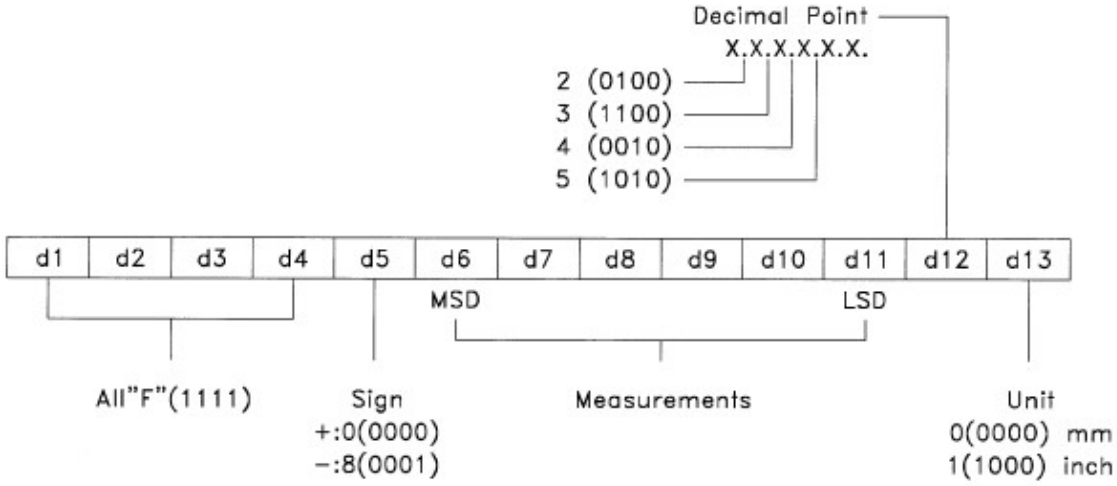
Output Connector Specification:



Pin No.	Signal	I/O
1	GND	–
2	DATA	O
3	CK	O
4	N.C.	–
5	$\overline{REQ}$	I



Output Data Format:



Timing Chart:

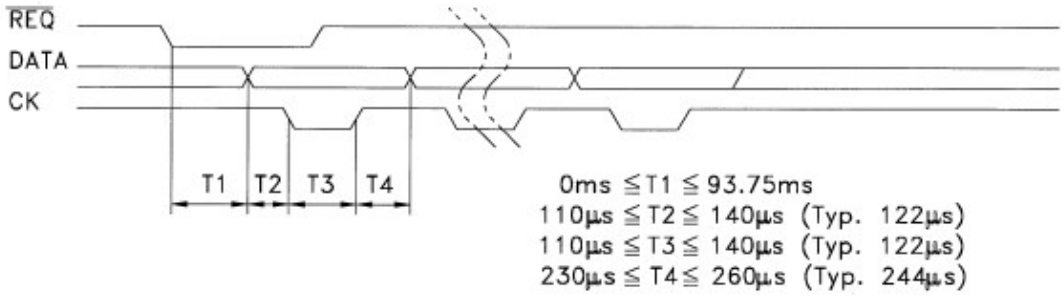


Figure 2. Data Output

Operation

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Specifications

In order to determine the specifications for the A028F gages, Maury performed an extensive gage study with the gages at the Maury factory. The study involved the use of multiple gages and personnel making multiple measurements of a known standard. A statistical analysis was performed on the data collected and the resultant +/- 2-sigma value was determined. Maury considers this value to be the achievable uncertainty under carefully controlled conditions in a controlled environment. The +/- 2-sigma uncertainty for the Maury A028F connector gage is +0.0018mm (±0.000070inches).

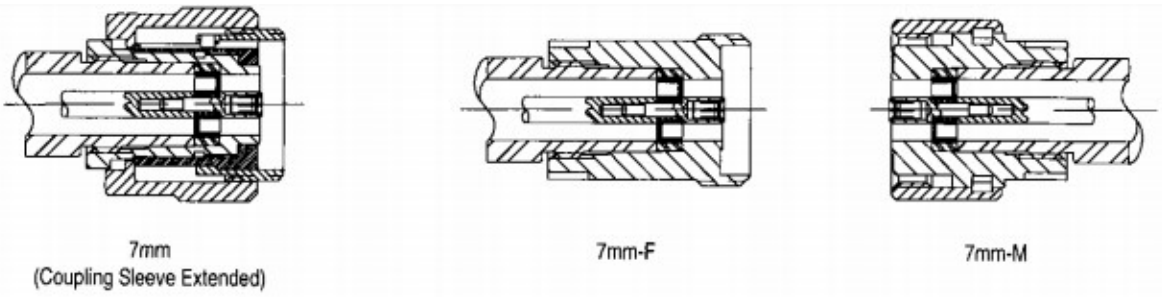

Figure 3. 7mm Connector and Sexed Variations

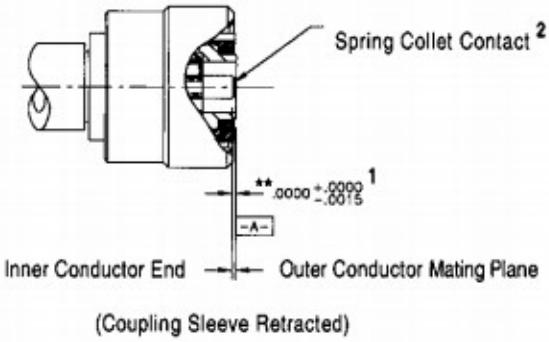

Figure 4. Coplanar Interface Requirements for 7mm Connector
****Tolerance shown is for 7mm GPC, the recommended 7mm LPC tolerance is +.000/-.0005**

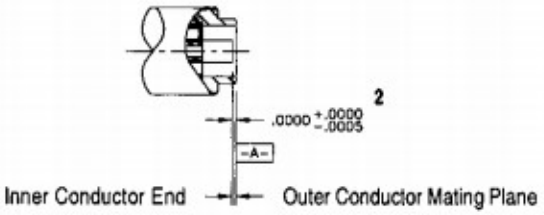

Figure 5. Air Line Assembly

NOTES

1 Minus tolerance indicates that the inner conductor is recessed or below plane [-A-]. This provides a direct reading based on the polarity of the dial indicator face.

2 The spring contact must be removed prior to gaging.

Visual Inspection

Inspect all connectors carefully before each use. If a connector shows deep scratches, dents, uneven wear, or particles clinging to the mating plane surfaces, clean it and inspect again. Damaged connectors should be set aside for repair. Also, try to determine the cause of the damage before making further connections.

Cleaning

Use dry compressed air at a very low velocity first; then a solvent such as isopropyl alcohol. Clean the contacting surfaces, alignment parts and threads using a lint free swab. Then re-inspect the connector to make sure that no fibers have been left around the contact and interface surfaces.

NOTE: To maintain cleanliness, always wear cotton gloves when performing any of the procedures described in this manual.

CAUTION: For optimum measurements and to prevent damage, always hold the connector gage on the knurled part of the bushing when connecting. Never rotate parts against each other since this could yield faulty readings or damage the mating surfaces.

Error Messages

Figure 3 show the error messages which the indicator may display, as well as the appropriate response.

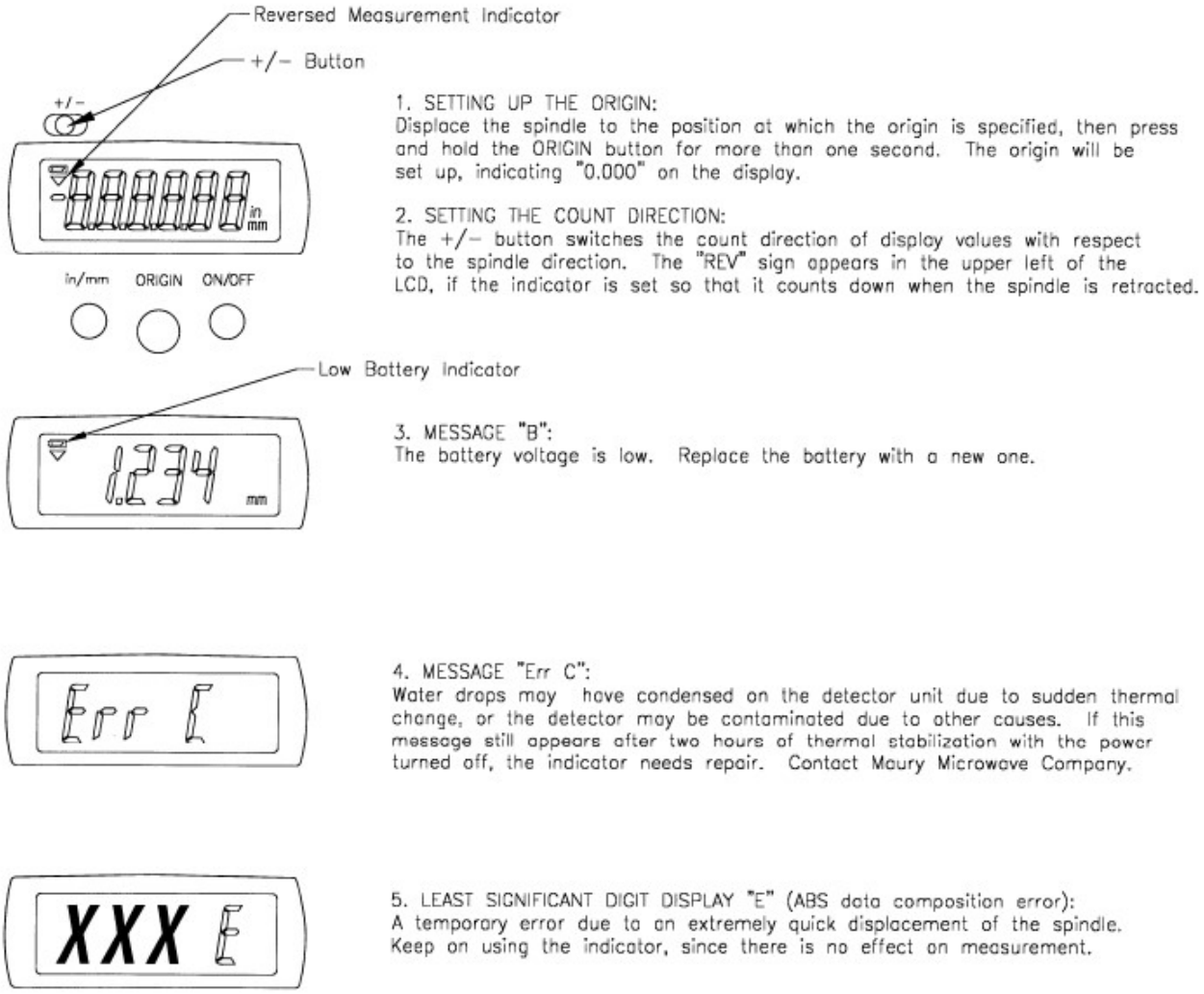

Figure 3. Operating Procedures and Error Messages

Gaging Precision 7mm Connectors

The critical mechanical specification in precision 7mm connectors is the recession (setback) of the center conductor relative to the outer conductor mating plane (Figure 3 and 4). No protrusion of the center conductor in from of the outer conductor mating plane is allowable.

The following procedure applies to the connector gage. For the connector gage A028F1, use the A028D2 master setting gage.

Before measuring a 7mm connector. Use a collet extraction tool similar to the Maury 2697S5, remove the spring collet contact. Use care in this operation. Do not nick or scratch the end of the inner conductor or damage the contact itself.

Procedure: Refer to Figure 4

1. Visually inspect the mating surfaces of your A028F1 connector gage and A028D2 master setting gage
2. Clean all mating surfaces of the master setting gage and connector gage using the recommended cleaning procedure above.
3. Push the ON/OFF button on the indicator to turn on the display.
4. Push the in/mm button until the display reads “in”
5. Set the +/- button so that the REV sign does ***NOT*** appear on the LCD.

   NOTE: Without anything connected to the gage and the REV sign ***NOT*** appearing in the display the gage should show a minus (-) number.
6. Extend the coupling sleeve of the 7mm connector to be measured.
7. Align the connector gage and master setting gage carefully, then rotate the nut on the gage, allowing it to engage with the thread of your A028D2. Apply light finger pressure avoiding rotation of the mating planes. If you use a torque wrench, it should be rated at 12 inch-pounds. Maury model 2698C2 is recommended and supplied with the A028F kit. Hold the corresponding part with the 3/4 open end wrench supplied with the kit.
8. Push and hold the ORIGIN button until the display reads 0.0000 inches. This sets the indicator reading to the nominal dimension of .000” (or other nominal dimensions provided by other master setting gages).
9. Gently loosen and disengage the connector gage and the master gage
10. Reinsert collet after measurement of connector is complete.

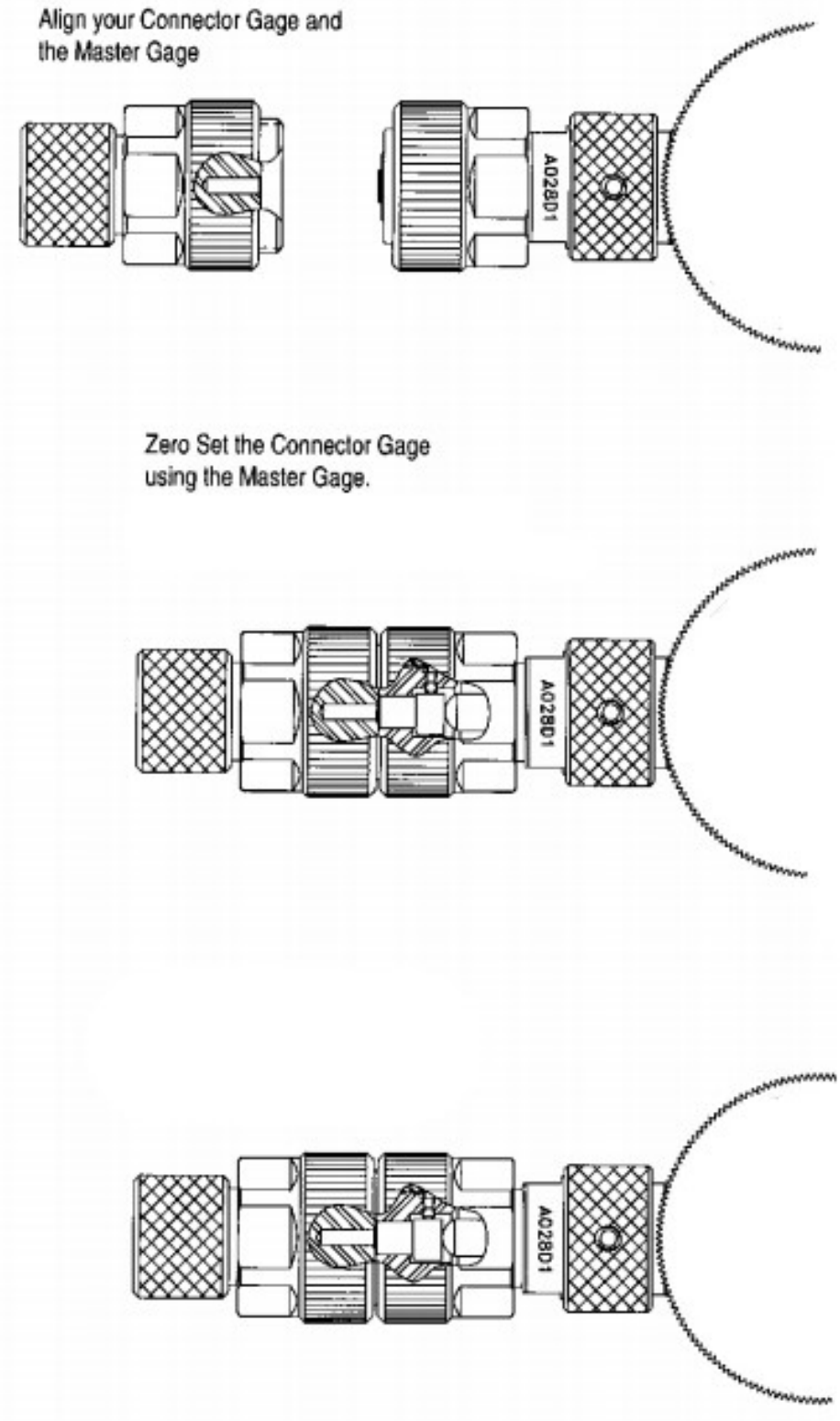

Figure 4. Gaging Precision 7mm Connectors

Sliding Loads and Air Lines

Most sliding loads come equipped with a simple center conductor lock consisting of some form of clamping mechanism. The sliding load connector interface is usually set for a “zero gap” or “flush set” as described below.

NOTE: *Gaging the sliding load is not required for zero gap operation.*

For flush set operation, the sliding load center conductor is first set to the correct position using a connector gage. Then the center conductor is aligned axially and connected to the mating connector.

NOTE: *The nominal interface dimension is set using the A028F type connector gage.*

Gaging Sliding Loads

CAUTION: This section may not have complete information for your particular sliding load. Please consult the manual for your sliding load first.

The following procedure applies to sliding loads. For 7mm sliding loads, use the A028F1 and A028D2 master gage. For in-depth information on how to properly set the interface dimension, refer to the manual provided with your sliding load.

Procedure

Refer to **Figures 5.**

1. Visually inspect the mating surface of the connector to be gaged before making a connection.
2. Clean all mating surfaces: connector, master setting gage and connector gage.
3. Zero set your connector gage with the appropriate master gage.
4. Remove the centering pin from the sliding load center conductor.
5. Loosen the center conductor locking mechanism in the rear of the sliding load.
6. Align the connector gage and the connector of the sliding load. Then carefully insert the aligning pin of the A028F1 into the sliding load center conductor.
7. Adjust the center conductor position so that it is within the specified interface dimension for a 7mm connector. (See Figure 6). Tighten the center conductor locking mechanism.
8. Disengage the sliding load and A028F1.
9. Reinsert the centering pin of your sliding load.

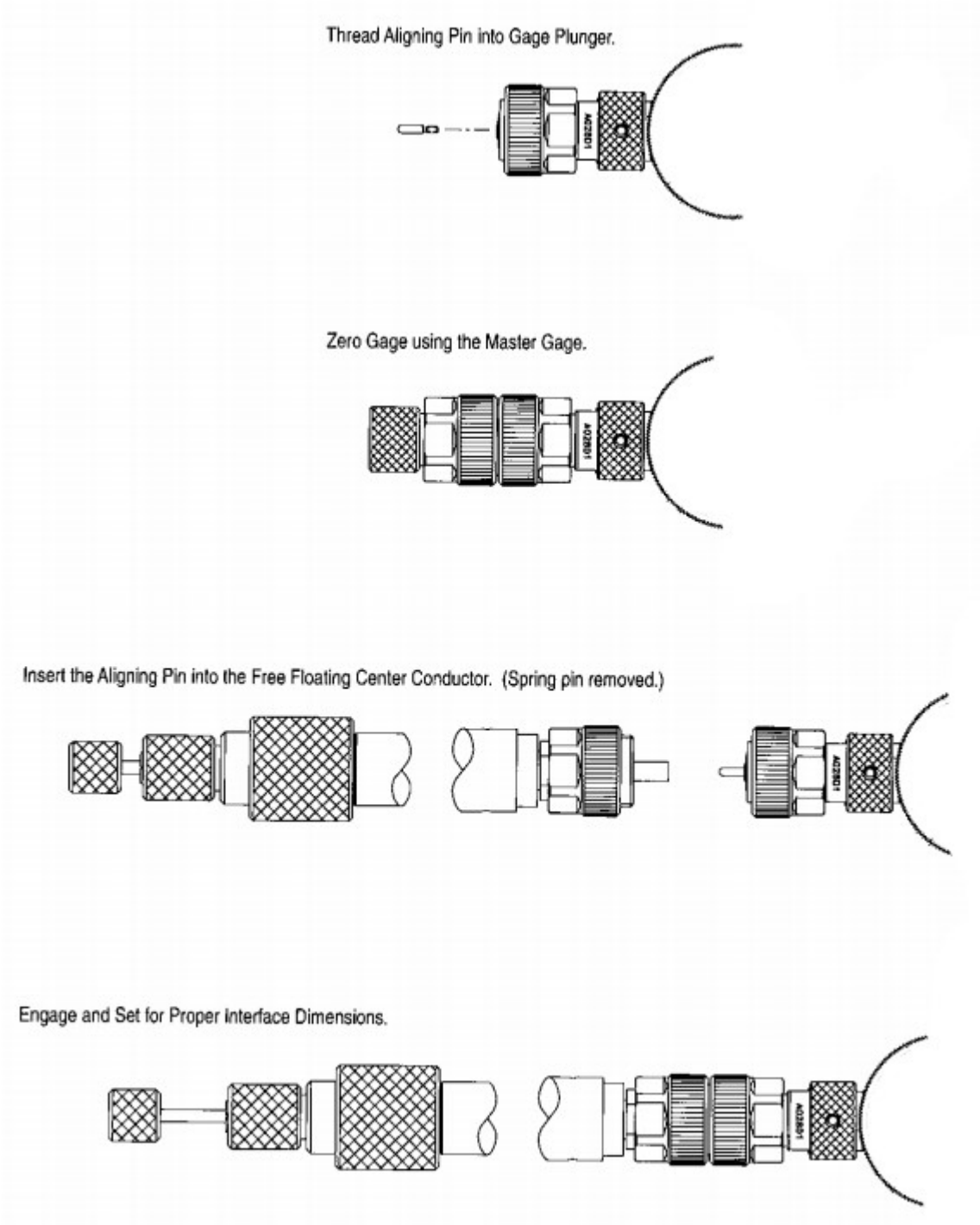

Figure 5. Gaging Precision Sliding Loads

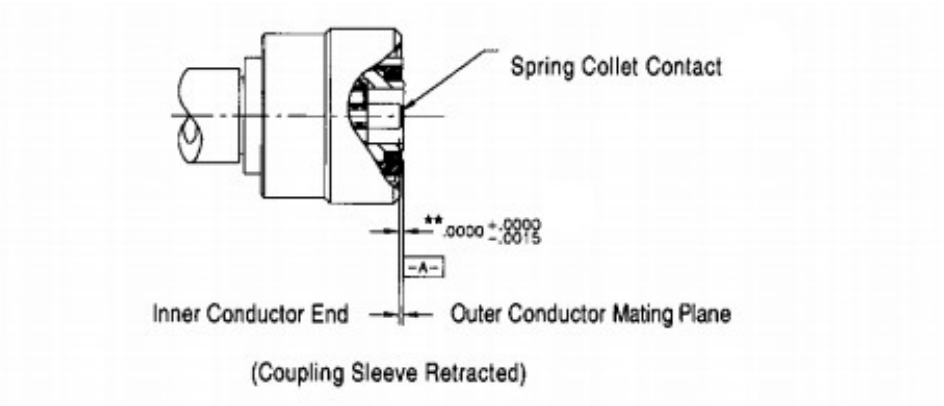

Figure 6. Interface Requirements for 7mm Connector

Gaging 7mm Air Lines

NOTE: Use care when handling air line parts. Wear cotton gloves to prevent excessive thermal expansion.

When using a 7mm airline, a master gage is first connected to one end of and the corresponding A028F indicator gage is connected to the opposite end.

Procedure

See **Figure 7**

NOTE: Sleeve set is required for this measurement (see parts list **Table 1**).

1. Visually inspect the mating surfaces on the airline to be gaged before making a connection, and clean all mating surfaces.
2. Remove the centering pins from both ends of the center conductor.
3. Zero set the connector gage using the respective master setting gage.
4. Slip a centering sleeve on one end of the center conductor and insert into the air line. Avoid scratching the outer conductor while inserting the center conductor. Make sure that the sex of the outer and center conductors comply.
5. Connect the corresponding master setting gage onto the same end of the air line where the sleeve was inserted.
6. Insert the second sleeve into the open end of the air line.
7. Align the air line and your A028F; then carefully connect the connector gage. Tighten finger tight avoiding rotation of the mating surfaces against one another. When using a torque wrench, make sure it is rated at 12 inch pounds.

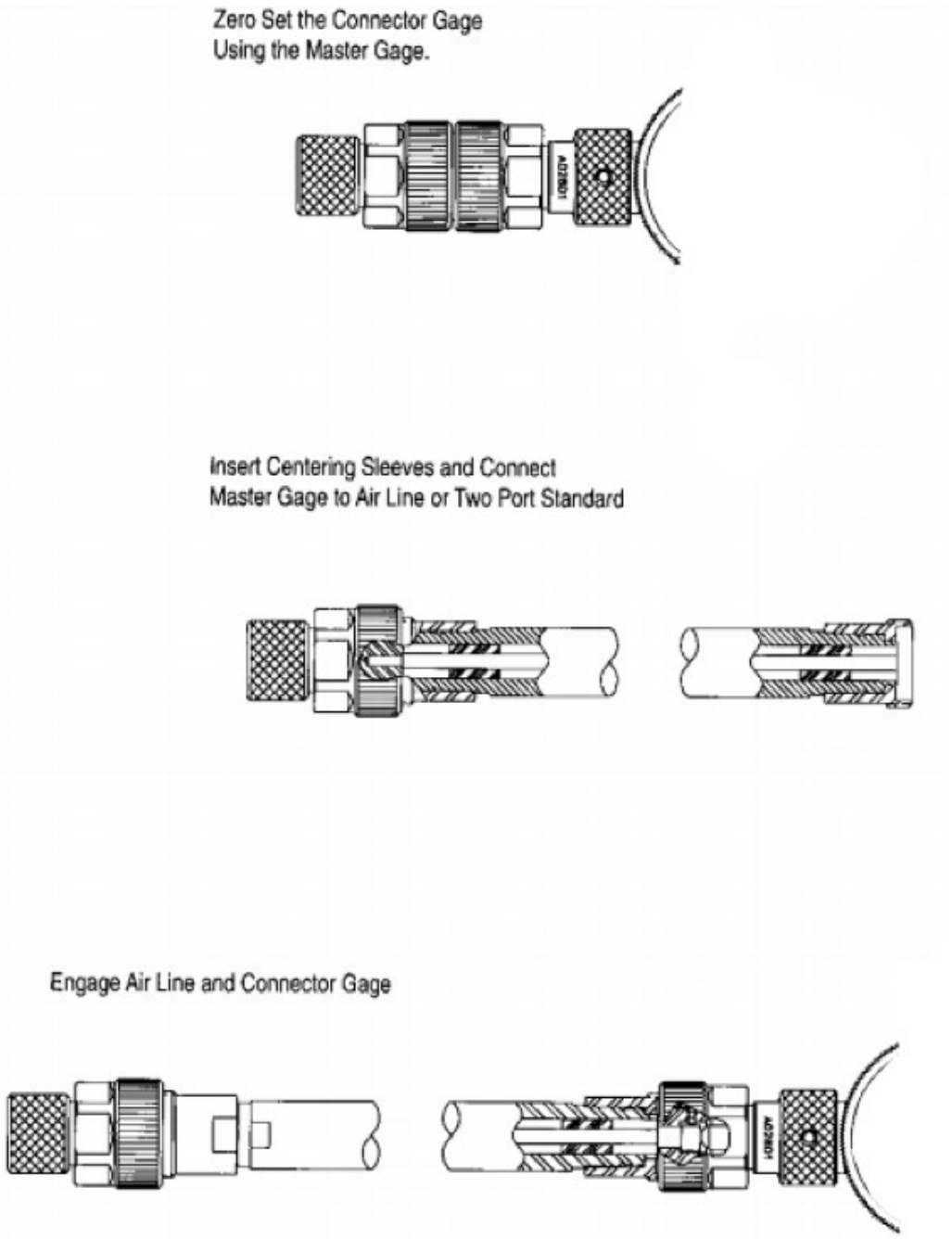

Figure 7. Gaging Beadless Precision 7mm Airlines

Maintenance and Calibration

Maintenance

This connector gage kit is relatively maintenance free if the components are handled with the same care that is appropriate to all precision equipment. As with any precision component, proper care should be taken to assure clean mating surfaces, correct alignment when mating, and proper torquing of connectors. To help maintain the integrity of the components in this kit, routine visual inspection and cleaning of mating surfaces is recommended. Failure to do so may result in degraded repeatability and accuracy, and may damage any mated devices. Refer to the *Operation* section of this User Guide for detailed instructions on visual inspection and cleaning.

Calibration

To maintain verification that a connector gage kit is performing to traceable specifications, we recommend that all kits be periodically returned to Maury Microwave for calibration. The typical calibration cycle is one year, although actual need may vary depending on usage.

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Appendix

Data Sheet Resources

2Y-051 – Connector Gages and Connector Gage Kits
http://maurymw.com/pdf/datasheets/2Y-051.pdf

2Y-050A – Torque Wrenches
http://maurymw.com/pdf/datasheets/2Y-050A.pdf

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Contacts

Corporate

Maury Microwave Corporation
2900 Inland Empire Boulevard
Ontario, California 91764-4804
United States of America

Tel 909-987-4715
Fax 909-987-5855
eMail maury@maurymw.com

Sales

Tel 909-204-3224
Fax 909-987-1112
eMail maury@maurymw.com

Customer Support

Tel 909-204-3283
Fax 909-987-1112
eMail support@maurymw.com

Web Site

http://maurymw.com

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