

6061T6 BACKPLATE WITH STANDARDS COMPLIANCE DATA (LOCATED ON BACK ON INSTRUMENT & SHOWN HERE FOR CONVENIENCE.)

SUBMINIATURE INTERFACE GAGING KEY

COM: COMMON USE IEEE287: GPC & LPC

TEST & GEN: MIL-STD-348/MIL-C-39012

INTERFACE	GPC	LPC	COM	TEST	GEN
SMA	X	X	-10	-3	-10
	X	X	-5/+2	-2/+0	-10
KEY: PIN~P	3.5	-2	-5	-3	-5
	2.92	-2	-5	-3	X
	2.4	-2	-5	-3	-3
	1.85	-2	-5	-3	X

ALL VALUES (IN MILS (001"))

KEY: DIEL~D

39012 ONLY

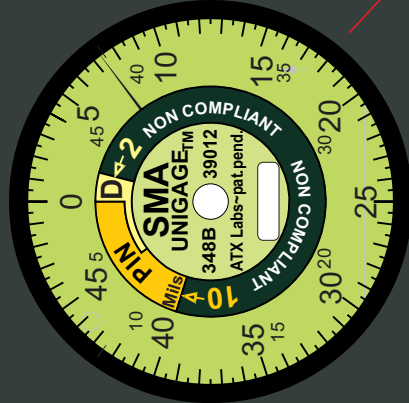
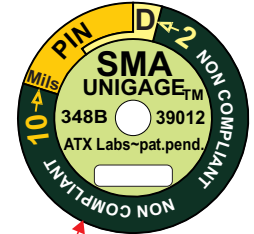
348 ONLY

PAT. PEND. ATX LABS/VM

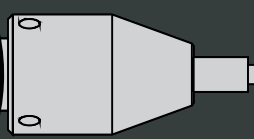
KEY: GEN- GENERAL SPEC

INTERFACE

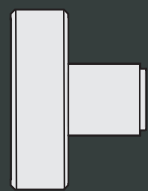
VINYL OVERLAY ON BEZEL GLASS WITH STANDARDS BOUNDARIES WELL DEFINED FOR ERROR FREE AND FAST GAGING. OVERLAY USES LOW ENERGY TAC FOR EASY REPLACEMENT OR REMOVAL.



MALE/FEMALE GAGE



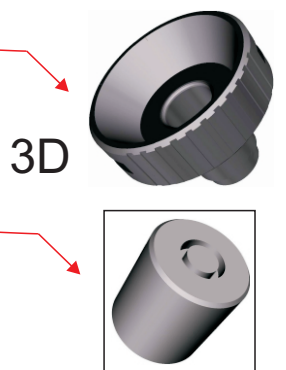
MALE GUIDE ACCESSORY



MASTER GAGE FOR ZEROING INSTRUMENT



GUIDE FOR MALE GAGING ELIMINATES THE TRADITIONAL SECOND GAGE AND MAKES PROBE SEATING QUICK AND ERROR FREE.



PAT. PEND. 6 1 98 69 7 8, 6 1 8 6 85 4 8, 6 1 9 8 6 8 2 2

**OVERVIEW:** PRECISION SMA GAGE KIT FOR THE DIMENSIONAL GAGING OF MALE AND FEMALE MICROWAVE CONNECTORS. THE KIT EMPLOYS A SINGLE SPINDLE AND DISPLAY WITH AN ERGONOMICALLY ADVANTAGED FASCIA TO SIMPLIFY GAGING. RELEVANT STANDARDS AND STANDARDS BOUNDARIES ARE CLEARLY DELINEATED. THE INSTRUMENT'S DESIGN ELIMINATES THE REQUIREMENT FOR A SECOND GAGE AND/OR BUSHING IN ORDER TO GAGE THE OPPOSITE GENDER, THEREBY REDUCING ACQUISITION AND MAINTENANCE COST WITH NO LOSS IN PRECISION AND ACCURACY. A FLAT SURFACE MASTER GAGE WITHOUT PROUD FEATURES IS EMPLOYED TO SIMPLIFY INSTRUMENT ZEROING. A THREADED GUIDE IS PROVIDED AS AN OPTIONAL FEATURE FOR THE GAGING OF MALE CONNECTORS TO ENHANCE MEASUREMENT STABILITY WITHOUT THE PENALTY OF A TORQUE REQUIREMENT OR TORQUE UNCERTAINTY.

**GENERAL SPECIFICATION**

- ~SURFACE FINISH OF Ra4 - Ra16 ON WORKING SLIDABLE SURFACE; BETTER THAN Ra32 IN REGIONS OF NON-CONTACT.
- ~MASTER GAGE FINISH OF Ra 8 OR BETTER.
- ~PRECISION SWISS TURNED AND MILLED STAINLESS STEEL.
- ~CRITICAL TOLERANCES OF 0.0005.
- ~DIAL ACCURACY OF +/- 0.0005
- ~ALL STAINLESS COMPONENTS PASSIVATED PER ASTM-A967.
- ~DIAL FASCIA AND DIAL BACKS WITH STANDARDS DELINEATION.

**WARRANTY:** ALL PERFORMANCE SERIES GAGES COME WITH A TEN YEAR WARRANTY ON STAINLESS COMPONENTS AND A ONE YEAR WARRANTY ON THE HOST INDICATOR.

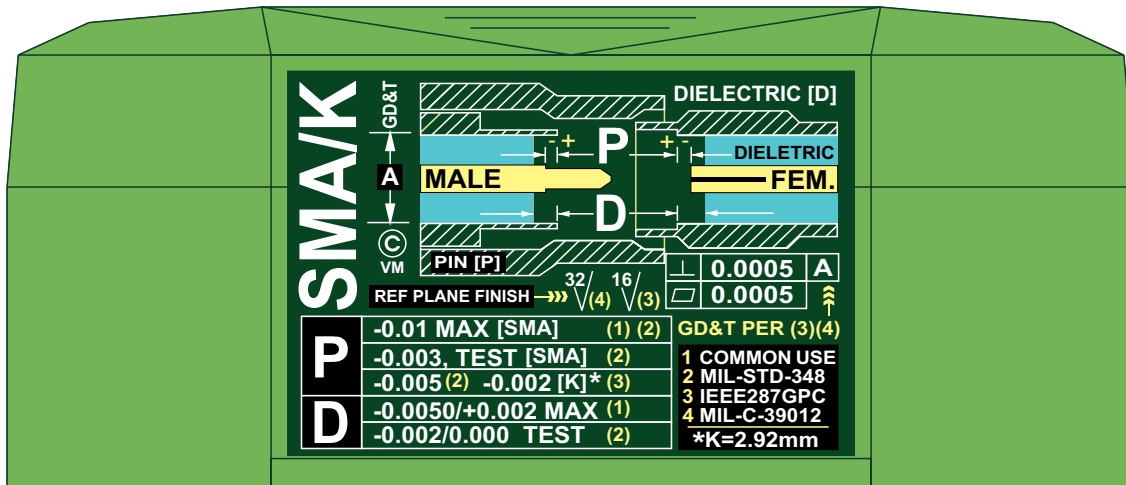
**PRECISION GAGE KITS**

SMA~ELEMENT SERIES

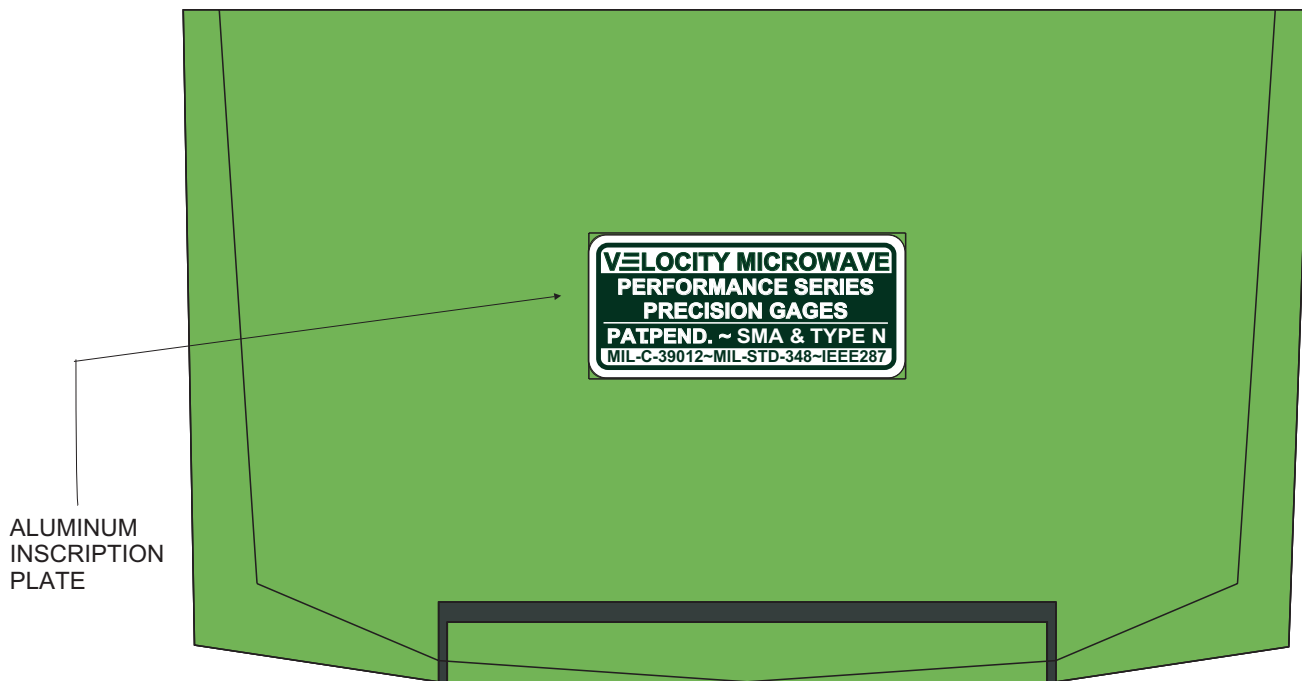
MALE & FEMALE PIN

Velocity Microwave ~ div. ATX Labs

www.velocitymicrowave.com



ALL PERFORMANCE SERIES SMA AND N GAGES CARRY A CUSTOM PRINTED VINYL GRAPHIC THAT ILLUSTRATES THE INTERFACE COMPLIANCE DATA RELATIVE TO THE CONNECTOR SERIES UNDER TEST INCLUDING MIL-STD-348, MIL-C-39012 AND IEEE287GPC. FOR REFERENCE K (2.92mm) IS ALSO INCLUDED. THIS GRAPHIC COMPLEMENTS THE BEZEL LENS OVERLAY WHICH PROVIDES TOLERANCE ZONES IN GRAPHIC FORM TO IMPROVE COMPLIANCE INTERPRETATION.



ALUMINUM INSCRIPTION PLATE

### GENERAL SPECIFICATION

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- ~DIAL ACCURACY OF +/- 0.0005
- ~ALL STAINLESS COMPONENTS PASSIVATED PER ASTM-A967.
- ~DIAL FASCIA AND DIAL BACKS WITH STANDARDS DELINEATION.

**WARRANTY:** ALL PERFORMANCE SERIES GAGES COME WITH A TEN YEAR WARRANTY ON STAINLESS COMPONENTS AND A ONE YEAR WARRANTY ON THE HOST INDICATOR.

### PRECISION GAGE KITS

SMA~ELEMENT SERIES  
MALE & FEMALE PIN

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THE ACT OF "GAGING" A MICROWAVE CONNECTOR IS SIMPLY THE ACT OF DETERMINING THE DIFFERENCE IN GRADE BETWEEN TWO POINTS INSIDE THE CONNECTOR: TYPICALLY THE OUTER COAXIAL BODY'S FRONT (MATING) PLANE AND A GEOMETRIC FEATURE ON THE MALE PIN (TYPICALLY THE SHOULDER) OR ON THE FEMALE PIN (TYPICALLY THE FRONT PLANE). GAGING IS SIMPLE IN BOTH CONCEPT AND EXECUTION.

THE CONVENTIONAL METHOD FOR DETERMINING A GRADE DIFFERENCE IS TO USE A DIAL INDICATOR WITH A FIXED STEM AND A MOVABLE RACK OR SPINDLE. THE SPINDLE COMMUNICATES ITS MOTION AND POSITION RELATIVE TO A PRESET ZERO CONDITION TO THE HAND ON THE INDICATOR'S DIAL FACE. THE TRADITIONAL APPROACH IN MICROWAVE GAGING IS TO ATTACH A FIXED BUSHING TO A CONVENTIONAL DIAL INDICATOR'S STEM AND A CONTACT POINT TO THE DIAL INDICATOR'S MOVABLE SPINDLE. WHEN THE BUSHING IS MADE TO REST ON THE OUTER BODY'S MATING PLANE AND THE CONTACT POINT IS MADE TO REST ON THE FEATURE OF INTEREST, LIKE A PIN'S SHOULDER, THE HAND OF THE DIAL SHOWS THE GRADE DIFFERENCE. WHILE THIS TRADITIONAL APPROACH ADDS A BUSHING AND CONTACT POINT, NO CHANGE IS MADE TO THE DIAL INDICATOR'S INDICIA OR FASCIA. AND TYPICALLY THIS LEGACY APPROACH REQUIRES TWO GAGES FOR THE MALE AND FEMALE. IN THIS MANNER, THE "RECESSION" (OR "PROCESSION" IN THE CASE OF NON-COMPLIANCE) OF THE MALE PIN'S SHOULDER OR THE FEMALE PIN'S FRONT PLANE RELATIVE TO THE OUTER COAXIAL BODY'S MATING PLANE IS DETERMINED.

## VM PAT.PEND. APPROACH

GAGING THEN, IN THE SIMPLIFIED SECTIONAL IMAGES OF SUBMINIATURE CONNECTORS SHOWN TO THE RIGHT, THE DIFFERENCE R-S WOULD BE COMPARED TO A STANDARD LIKE MIL-STD-348, THAT REPRESENTS THE INTERFACE SPECIFICATION WITH WHICH THE CONNECTOR IS REQUIRED TO COMPLY.

TO THIS END THE MICROWAVE GAGING OF SUBMINIATURE CONNECTORS HAS BY TRADITION EMPLOYED A SEPARATE GAGE FOR EACH CONNECTOR GENDER. WITHIN THIS APPROACH A DISTINCTION WAS MADE BETWEEN FREE HAND GAGING, IN WHICH THE USER PLACES THE WORKING END OF THE GAGE ON THE CONNECTOR'S INTERFACE MANUALLY, AND THREADED ENGAGEMENT, WHEREIN THE USER THREADS THE GAGE ON TO THE CONNECTOR IN THE SAME MANNER AS AN ACTUAL MALE/FEMALE CONNECTOR ENGAGEMENT.

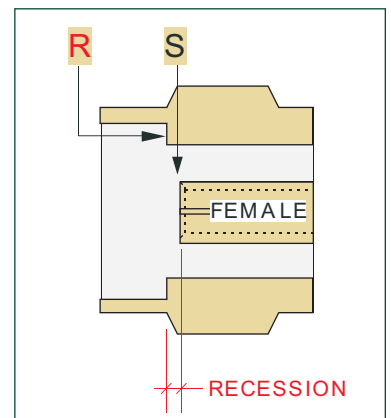
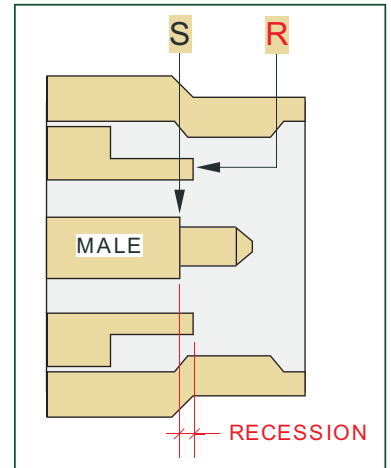
VM'S PATENT PENDING APPROACH TO SUBMINIATURE GAGING IS BASED ON SEVERAL DIFFERENT PRINCIPLES.

[1] A SINGLE GAGE/INDICATOR (AS OPPOSED TO THE CUSTOMARY TWO) IS USED FOR BOTH MALE AND FEMALE GENDERS THEREBY SIMPLIFYING GAGING AND REDUCING COST- BUT WITH NO LOSS IN ACCURACY OR PRECISION;

[2] ONLY ONE MASTER GAGE IS USED (AS OPPOSED TO CONVENTIONAL DUAL MASTERS) THAT CONTAINS A PRECISION GROUND, CLOSELY TOLERANCED, FLAT STAINLESS STEEL SURFACE - THEREBY VIRTUALLY ELIMINATING MASTER GAGE ERROR WITH REGARD TO SURFACE ACCURACY;

[3] FOR MALE GAGING A SEPARATE THREADED GUIDE IS PROVIDED THAT REQUIRES NO SPECIFIC TORQUE, IS EASIER TO MATE THAN TORQUE SPECIFIC THREADED ENGAGEMENT, AND INTRODUCES NO MEASUREMENT UNCERTAINTY AS A FUNCTION OF UNCERTAIN TORQUE CALIBRATION OR SETTING.

[4] THE HUMAN INTERFACE IS ENHANCED WITH ADVANCED ERGONOMICS TO PROVIDE INSTANT FEEDBACK RELATIVE TO ALL STANDARDS, AND REAL VALUE INDICIA ARE USED TO SPECIFY TRUE RECESSION AND TRUE PROCESSION - THEREBY SPEEDING GAGING AND ELIMINATING POTENTIAL CONFUSION. THE VM GAGE BACK IS ALSO ENHANCED.



## GENERAL SPECIFICATION

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~MASTER GAGE FINISH OF Ra 8 OR BETTER.

~PRECISION SWISS TURNED AND MILLED STAINLESS STEEL.

~CRITICAL TOLERANCES OF 0.0005.

~DIAL ACCURACY OF +/- 0.0005

~ALL STAINLESS COMPONENTS PASSIVATED PER ASTM-A967.

~DIAL FASCIA AND DIAL BACKS WITH STANDARDS DELINEATION.

**WARRANTY:** ALL PERFORMANCE SERIES GAGES COME WITH A TEN YEAR WARRANTY ON STAINLESS COMPONENTS AND A ONE YEAR WARRANTY ON THE HOST INDICATOR.

## PRECISION GAGE KITS

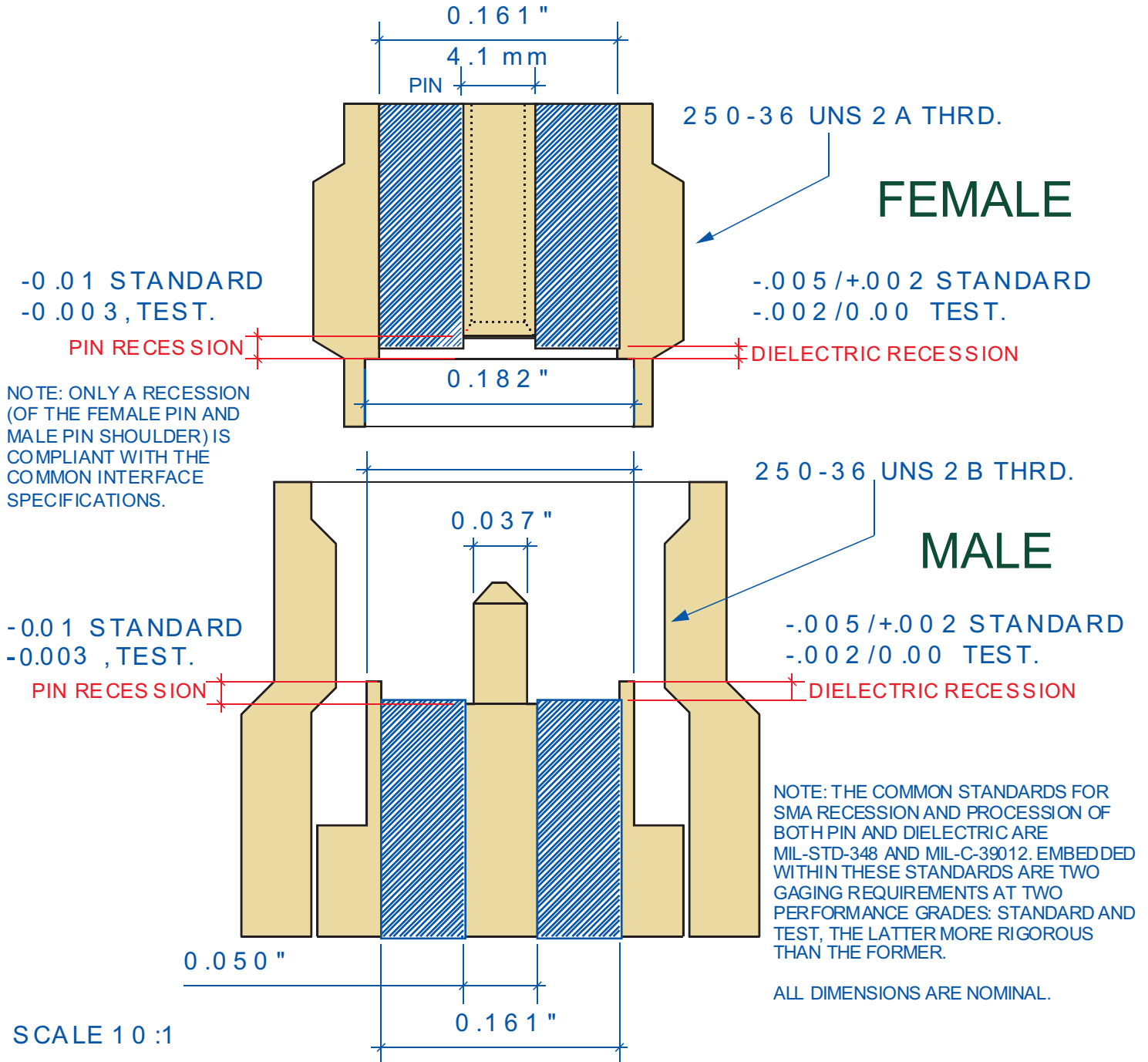
SMA~ELEMENT SERIES

MALE & FEMALE PIN

Velocity Microwave ~ div. ATX Labs

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# SMA INTERFACE PER MIL-STD-348B MIL-C-39012 GENERAL PURPOSE & TEST



## GENERAL SPECIFICATION

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~DIAL ACCURACY OF +/- 0.0005

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## PRECISION GAGE KITS

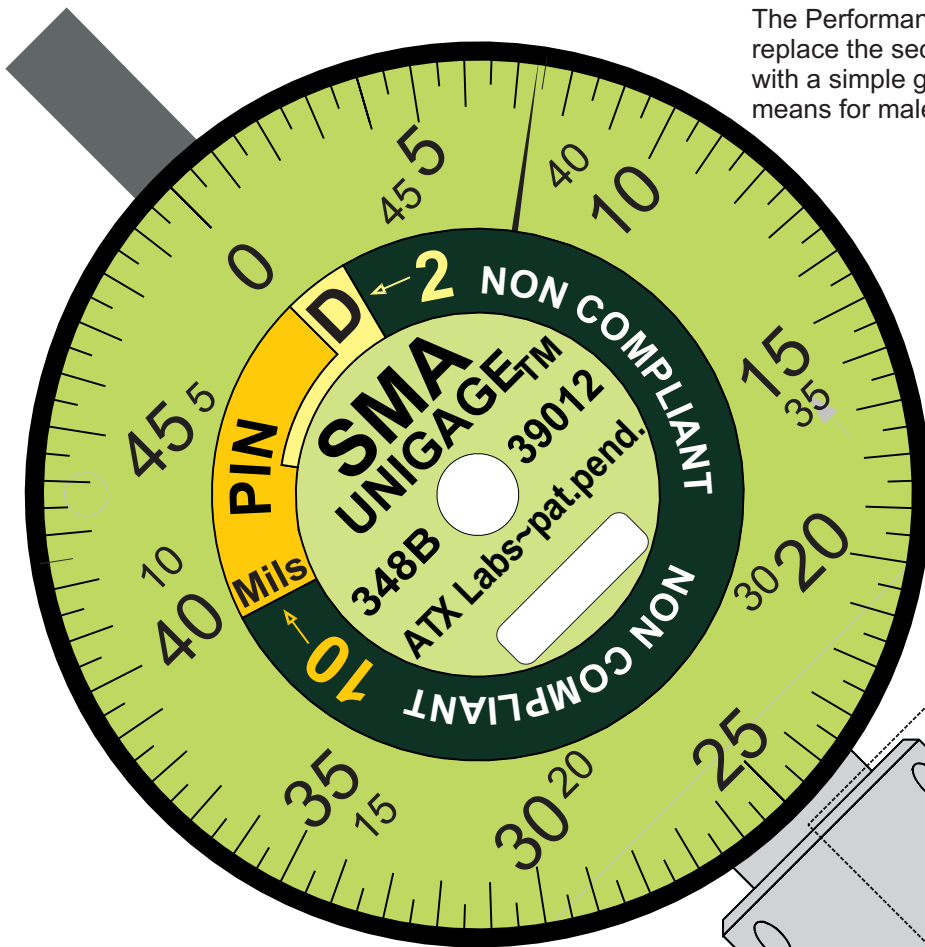
SMA~ELEMENT SERIES

MALE & FEMALE PIN

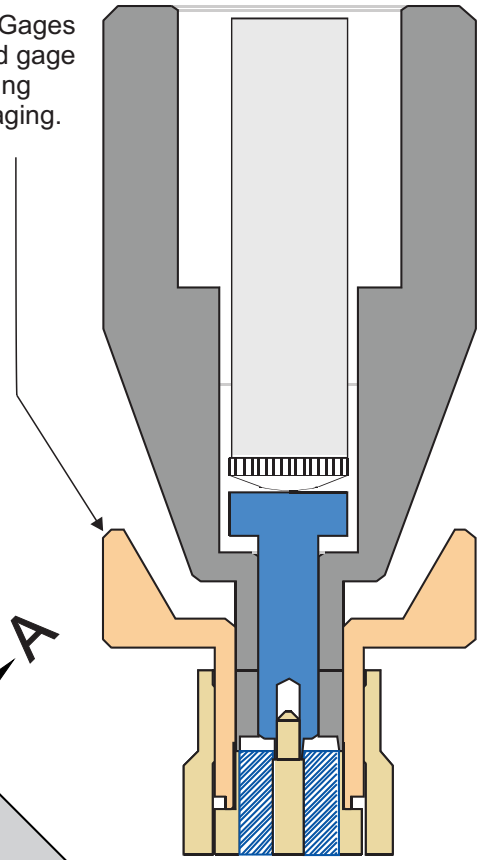
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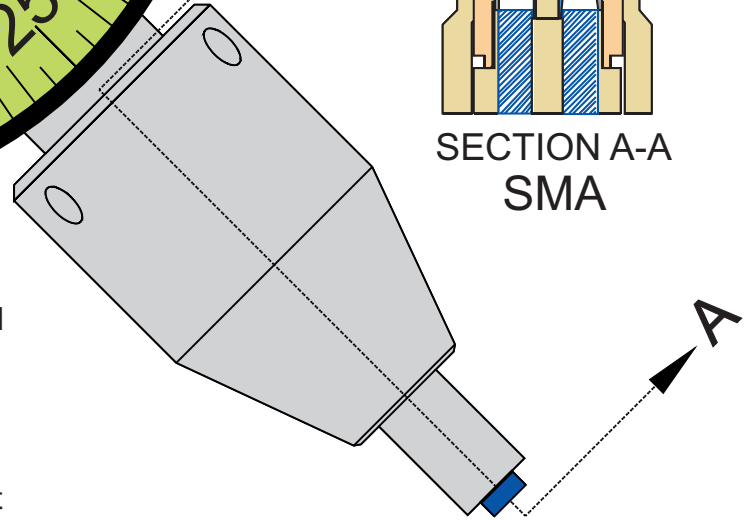
The Performance Gages replace the second gage with a simple guiding means for male gaging.



VM's Performance Gages introduce a vinyl overlay on the bezel lens that provides the boundaries for Standards like MIL-STD-348B and MIL-C-39012. The boundaries are expressed as tolerance zones and provide a quick measure of compliance. The minor scale gives pin and dielectric recession and the major scale gives pin and dielectric procession - mostly a noncompliant condition except for some of the earlier Standards and for common practice that often tolerates mild dielectric procession. The latter condition is indicated. For the SMA the band of interest lies between a recession of 10 mils and a procession of 2 mils for the dielectric when procession is tolerated..



SECTION A-A  
SMA



# GAGE FRONT

PERFORMANCE SERIES SMA

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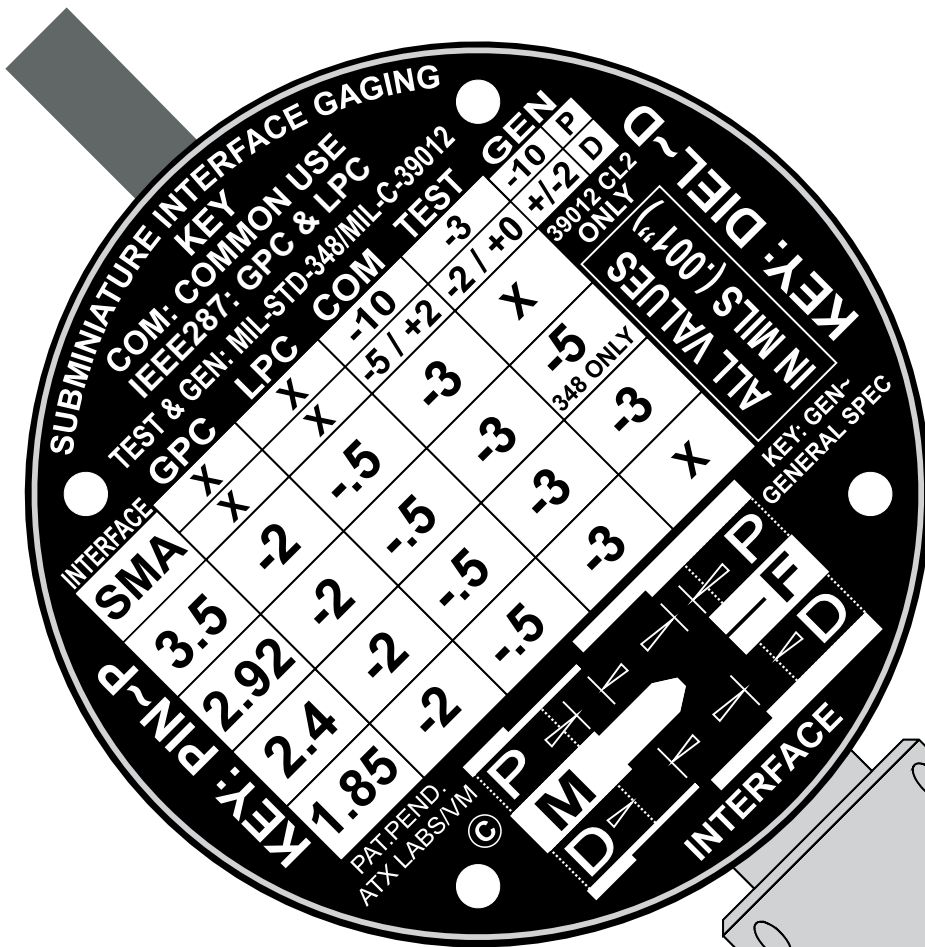
## PRECISION GAGE KITS

SMA~ELEMENT SERIES

MALE & FEMALE PIN

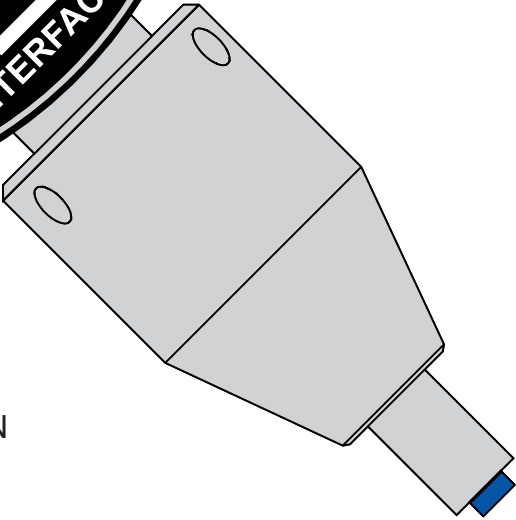
Velocity Microwave ~ div. ATX Labs

[www.velocitymicrowave.com](http://www.velocitymicrowave.com)



VM'S PERFORMANCE GAGE BACKS ALSO INDICATE, FOR USER REFERENCE, THE FULL SPECTRUM OF COMPLIANCE STANDARDS FOR 1.85mm, 2.4mm, 2.92mm (K), AND 3.5mm CONNECTORS. OBSERVE THAT THE VALUES ARE GIVEN IN MILS, WHERE ONE MIL = .001 INCHES.

ADDITIONALLY, A 2D GRAPHIC IS PROVIDED THAT ILLUSTRATES THE TYPICAL SECTIONAL VIEW OF THE SUBMINIATURE CONNECTOR, MALE AND FEMALE, AND SHOWS THE RECESSION GEOMETRY FOR PIN TO OUTER BODY REFERENCE PLANE AND DIELECTRIC TO OUTER BODY REFERENCE PLANE.



VM'S PERFORMANCE GAGES CONTAIN A CUSTOM METAL BACK THAT ADDS TO THE COMPLIANCE DATA PROVIDED AS TOLERANCE ZONE GRAPHICS ON THE BEZEL LENS. THE ALUMINUM BACKS ARE PRINTED IN BOLD RELIEF AND MOUNTED WITH FOUR SCREWS TO THE HOST INDICATOR. THE TOP ROW OF A TABULAR LAYOUT CONTAINS THE COMPLIANCE INFORMATION FOR MIL-STD-348 AND MIL-C-39012 TEST AND GENERAL PURPOSE INTERFACES. THE COMMON USE CATEGORY REFERS TO INDUSTRY PRACTICE WHICH IS GENERALLY THE MOST LENIENT OF THE CATEGORIES.

# GAGE BACK

PERFORMANCE SERIES SMA

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