

TYPE N DIGITAL METROLOGY-GRADE CONNECTOR GAGE KIT

A020K

Description

The Maury A020K digital connector gage kit is designed for measuring the critical female and male interface contact pin locations of Type N connectors per IEEE-STD-287-2000. By pressing the in./mm button on the face of the A020K, female or male indicators, users can easily switch between standard or metric measurement modes, providing resolution of 0.00004 inches or 0.001 mm respectively. (For optimum gaging, Maury recommends using these gages in the metric mode first, then converting to inches by multiplying the metric reading times 25.4, or by simply pressing the in./mm mode button to make the conversion automatically. The former method provides higher resolution, and users should be aware that the latter method will cause a slight loss of resolution resulting from the limitations of the digital display.)

As with all Maury metrology-grade connector gages, excellent repeatability and reliability is ensured by the tightly controlled tolerances and use of heat-treated stainless steel gage members.

Each A020K kit consists of two digital indicator assemblies, male and female setting gages, two center conductor centering sleeves, a torque wrench and an open end wrench — all provided in a wood instrument case with operating instructions. The Maury A020K1 (female) and A020K2 (male) connector gage assemblies feature the "thread-on" design, which simulates the actual mating conditions of type N connectors. This allows for easy, hands-free operation when making measurements and eliminates the difficulty in measuring vector network analyzer test port adapters when connected to the test set. Both indicator assemblies have digital readouts that allow measurements to be read directly, and are compatible with the Mitutoyo SPC, digimatic system.

The two centering sleeves provided in the A020K gage kits facilitate measurement of precision beadless airlines and two-port standards. "Flush setting" of Maury metrology-grade sliding loads (models 8834A and 8834B) is easily accomplished using this connector gage kit.

The A020K kit also includes A020D3 (female) and A020D4 (male) master gages for measuring type N female and male interfaces (such as GPC, LPC and Maury precision and high-precision interfaces) per IEEE-STD-287-2007 (0.207F and 0.207M).



*A020K Metrology-Grade
Type N DIGITAL Connector
Gage Kit*

Measuring MIL-STD-348A (Ref: 402.1 and 402.2) male test connectors or MIL-T-81490 male connectors requires ordering the optional Maury A020D14 .207F and .208M master gage.

Measuring MIL-STD-348A (Ref: 304.1 and 304.2) series N female and male connectors requires ordering the optional Maury A020D15 (0.210 male) master gage (.207F and .210M).

For 75Ω type N female and male connectors we recommend purchasing the A020G analog gage kit. (**Caution: the A020K will not work for this application.**)

Each A020K kit includes a Maury 3/4-inch torque wrench (model 2698C2) and a 9/16-inch open end wrench (model A040S5), allowing you to make repeatable measurements by torquing the master gages and DUT connector to the gage. Ordering the A020K Option 10 removes the torque wrench for a more affordable kit.

Specifications

In order to determine the specifications for the A020K 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 A020K connector gage is $\pm 0.0018\text{mm}$ (± 0.000070 inches). In addition to uncertainty

of the gage, the Type N set master uncertainty must also be considered. The tolerance for the Type N set master would add an additional ± 0.0002 inches (± 0.0051 mm) [0.0004 inch (0.0102mm) range] of uncertainty to the total uncertainty.

The total worst case uncertainty for the A020K gage kit can be determined by adding these two values together for a total uncertainty of ± 0.000270 inches.

Table 1.

Model	Gage Assemblies	Measurement Resolutions	Applications
A020K	2 each	0.00004 in. (0.0001mm)	Measures type N female and male connectors, sliding loads, airlines, two-port standards, VNA test port adapters, etc.

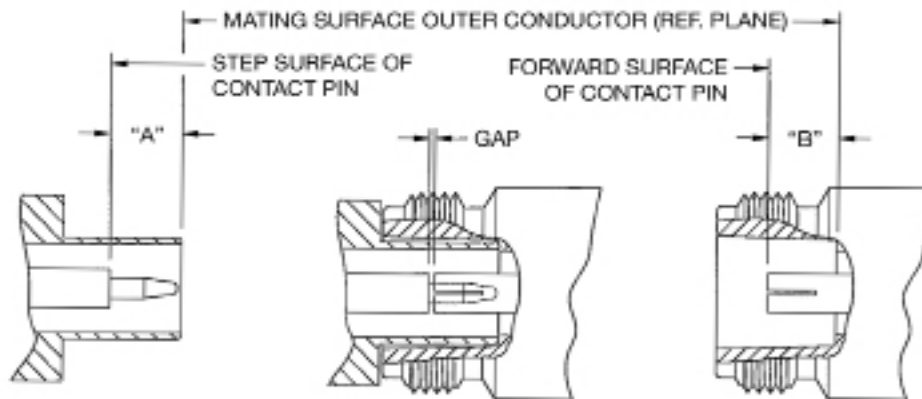


Figure 1

Table 2. Contact Pin Locations for Commonly used Type N Connectors

ITEM	SPECIFICATION	A		B		GAP		COMMENTS
						MIN	MAX	
A	High Precision ¹	0.207	+0.0005 -0.0000	0.207	+0.0000 -0.0005	0.0000	0.001	Maury High Precision Type N
B	Precision ²	0.207	+0.003 -0.000	0.207	+0.000 -0.003	0.000	0.006	Maury Precision I.A.W. 5E-049
C	IEEE STD 287-2007	0.207	+0.004 -0.000	0.207	+0.000 -0.003	0.000	0.007	LPC & GPC
D	MIL-STD-348A Test Connector ^{3,5}	0.208	+0.003 -0.000	0.207	+0.000 -0.003	0.001	0.007	402.1, 402.2 & MIL-PRF-39012 Class 1
E	MIL-STD-348A ⁵	0.210	+0.020 -0.000	0.207	+0.000 -0.020	0.003	0.040	304.1, 304.2 & MIL-PRF-39012 Class 2
F	MIL-C-39012 Class 1 ^{3,4}	0.208	+0.003 -0.000	0.207	+0.000 -0.003	0.001	0.007	Standard Test Connector
G	MIL-C-39012 Class 2 ⁵	0.210	+0.020 -0.000	0.207	+0.000 -0.020	0.003	0.040	Type N General Specification ³
H	MIL-T-81490 ³	0.208	+0.003 -0.000	0.207	+0.000 -0.003	0.001	0.007	Type EW Connectors

¹ "High Precision" Maury type "N" connector interfaces are used on primary standards, such as air lines, sliding loads, etc.

² "Precision" Maury type "N" connector interfaces are used on all Maury standard type N components.

³ Type N male outer conductors may be slotted or solid. Items A, B, C, D & E are solid, F, G & H may be slotted or solid.

⁴ Use A020D14 Master Gage (male .208 dim.) Optional.

⁵ Use A020D15 Master Gage (male .210 dim.) Optional.