1.0 GENERAL:

1.1 Purpose:
This specification defines standards of minimum performance and conditions under which the standards apply for the United Instruments, Inc. Part Number's 8000, 8025 and 8030 Airspeed Indicators.

1.2 Description;
The airspeed indicator is intended for use on aircraft to indicate the speed relative to the air at sea level and when used at any other altitude, to indicate the equivalent speed corresponding to the actual sustaining force of the air.

When properly connected to an airspeed tube, mounted so as to be in undisturbed air, a single pointer indicates the differential pressure developed between the pitot and static opening. This pressure is indicated in units of air speed (MPH or Knots). The normal position of the pointer when at Zero is vertical, pointing upward. From this position it moves clockwise.

1.3 Operating Limits:
United Instruments, Inc. Airspeed Indicator part number 8000 operates through a calibrated range of 0 to 200 miles per hour.

United Instruments, Inc. Airspeed Indicator part number 8025 operates through a calibrated range of 0 to 250 miles per hour.

United Instruments, Inc. Airspeed Indicator part number 8030 operates through a calibrated range of 0 to 300 miles per hour.

2.0 STANDARD TEST CONDITIONS:

2.1 Atmospheric Conditions:
Unless otherwise specified, all tests required by this specification shall be conducted at an atmospheric pressure of approximately 29.92 inches of mercury and at an ambient temperature of approximately 25° C and at a relative humidity of not greater than 85 percent.

2.2 Vibration:(To minimize friction)
Unless otherwise specified, all tests for performance shall be conducted with the instrument subjected to a vibration of 0.002 to 0.005 inch double amplitude at a frequency of 1500 to 2000 cycles per minute. The term double amplitude as used herein, indicates the total displacement from positive maximum to negative maximum.

2.3 Position:
Unless otherwise specified, all tests shall be conducted with the instrument in its normal operating position.

				C	4/25/77	CH. 250, 300MPH DIAL	MS	PREP. BY	McKinley	7-15-72
				B	8-5-75	CHANGE U.I. PART NO.	CB	APPR. BY		4/4/64
D.	41984	ADD DAMPING TEST(PG.3) AND CORRECT DIAL (B.1, 166, 7 & 10)	J.C.	A	11-1-72	RELEASE	SM	CHECKER		
REV.	DATE		CHK.	REV.	DATE		CHK.		NAME	DATE

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3.0 DETAIL REQUIREMENTS:

3.1 Indicating Method:
The instrument indicates by a means of a pointer moving over a fixed dial. Clockwise pointer motion indicates increasing airspeed.

3.2 Limitation of Pointer Movements:
The pointer movement is limited by stops in the mechanism in such a way that the pointer will not be permitted to rotate more than 10 degrees beyond the last graduation on the dial. Stops are incorporated in the instrument mechanism to limit counter-clockwise motion of the pointer.

3.3 Pressure Equivalents:
The instruments shall be calibrated to indicate air speed in accordance with the following pressure equivalents. (See Table I)

4.0 INDIVIDUAL PERFORMANCE REQUIREMENTS:

4.1 Scale Error:
The instruments shall be tested for scale errors, by subjecting the instrument to the pressure required to produce the test points first with the pressures increasing, then with the pressures decreasing. With the pressures increasing, the pressure shall be brought up to, but shall not exceed the pressure specified to give the desired reading; and with the pressure decreasing, the pressure shall be brought down to, but shall not fall below the pressure specified to give the desired reading. The scale errors at room temperature shall not exceed the tolerances specified in Table II.

4.2 Friction:
The instrument shall be tested for friction at the points indicated in Table III. The pressure shall be brought up to the desired reading and then held constant while two readings are taken; the first reading being taken before the instrument is vibrated, and the second one after the instrument is vibrated. The difference between any two readings shall not exceed the tolerance specified in Table III.

4.3 Position Error:
A pressure equivalent to one-quarter, one-half and three-quarters scale deflection shall be applied. The change in reading at each deflection produced by rotating the instrument from the dial vertical to the dial horizontal position and 90 degrees to the right and left, while the instrument is vibrated shall not exceed the tolerance specified in Table IV.

4.4 Leak:
With both the pitot pressure and static pressure connections simultaneously evacuated to 15 inches of mercury, the leakage shall not cause more than 0.05 inch of mercury pressure drop during a one minute period. With the static pressure connection open and pressure equivalent to full scale

4.4 Leak: (Continued)
pointer deflection applied to the pitot pressure connection, the leakage shall not cause more than 1 MPH or 1 knot decrease in indication during a one-minute period. This test shall be made with test apparatus containing the minimum practical volume.

4.5 Dampening
When sufficient pressure is applied to the pitot port to indicate maximum calibrated reading, the connection shall be suddenly broken. The time for the pointer to fall to 40 MPH shall be between 1 and 3 seconds.

5.0 ENVIRONMENTAL CONDITIONS:
When installed in accordance with United Instruments, Inc. instructions the instrument will function in the following environmental ranges.

5.1 Temperature:
-30 to 70C

5.2 Vibration:

C.P.S.	Max. Double Amplitude	Max. Acceleration
5 to 50	.020 Inch	1.5 g
50 to 500		0.5 g

5.3 Humidity:
0% To 95 At 32 C

5.4 Altitude:
The instrument shall function and shall not be adversly affected when subjected to a pressure and temperature range equivalent to -1,000 to 40,000 feet standard altitude, per NACA Report Number 1235.

6.0 INSTALLATION INSTRUCTIONS:

6.1 Mounting:
Front or rear panel mounting, attached with (4 ea) 6-32 screws and self-locking nuts.

6.2 Connection:
Connecting lines should be clean and connected to the appropriate ports.

6.3 Fitting:
The threads of the fitting inserted should be coated to prevent seizing and leakage.

TABLE I
DIFFERENTIAL PRESSURE - KNOTS AND MPH
Mercury at 0°C
Water at 15.8°C

Differential Pressures for Knots				Differential Pressures MPH		
Pounds Per Square Inch	Inches of Water	Inches of Mercury	Calibrated Airspeed	Inches of Mercury	Inches of Water	Pounds Per Square Inch
.0094	.261	.0192	20	.0145	.197	.0071
.0377	1.05	.0768	40	.0579	.788	.0284
.0590	1.63	.120	50	.0905	1.23	.0444
.0850	2.35	.173	60	.130	1.77	.0640
.116	3.21	.236	70	.178	2.42	.0872
.151	4.19	.308	80	.232	3.16	.114
.192	5.31	.390	90	.294	4.00	.144
.237	6.56	.482	100	.363	4.94	.178
.342	9.47	.696	120	.524	7.13	.257
.467	12.9	.950	140	.715	9.73	.351
.612	17.0	1.25	160	.936	12.7	.460
.777	21.5	1.58	180	1.19	16.2	.583
.964	26.7	1.96	200	1.47	20.0	.723
1.17	32.5	2.39	220	1.79	24.3	.878
1.40	38.8	2.85	240	2.13	29.0	1.05
1.65	45.8	3.37	260	2.52	34.2	1.24
1.93	53.5	3.93	280	2.93	39.9	1.44
2.23	61.8	4.54	300	3.38	46.0	1.66

TABLE II
SCALE ERROR AT ROOM TEMPERATURE

Test Point M.P.H.	U.I. P/N 8000 Tolerance ± M.P.H.	U.I. P/N 8025 Tolerance ± M.P.H.	U.I. P/N 8030 Tolerance ± M.P.H.
0	1/16 Inch Max.	1/16 Inch Max.	1/16 Inch Max.
40	2.0	2.5	3.0
50	2.0	2.5	3.0
60	2.0	2.5	3.0
70	2.0	2.5	3.0
80	2.0	2.5	3.0
100	2.0	2.5	3.0
120	5.0	2.5	3.0
140	5.0	6.0	3.0
160	5.0	6.0	7.5
180	5.0	6.0	7.5
200	5.0	6.0	7.5
220	- -	6.0	7.5
240	- -	6.0	7.5
250	- -	6.0	7.5
260	- -	- -	7.5
270	- -	- -	7.5
280	- -	- -	7.5
290	- -	- -	7.5
300	- -	- -	7.5

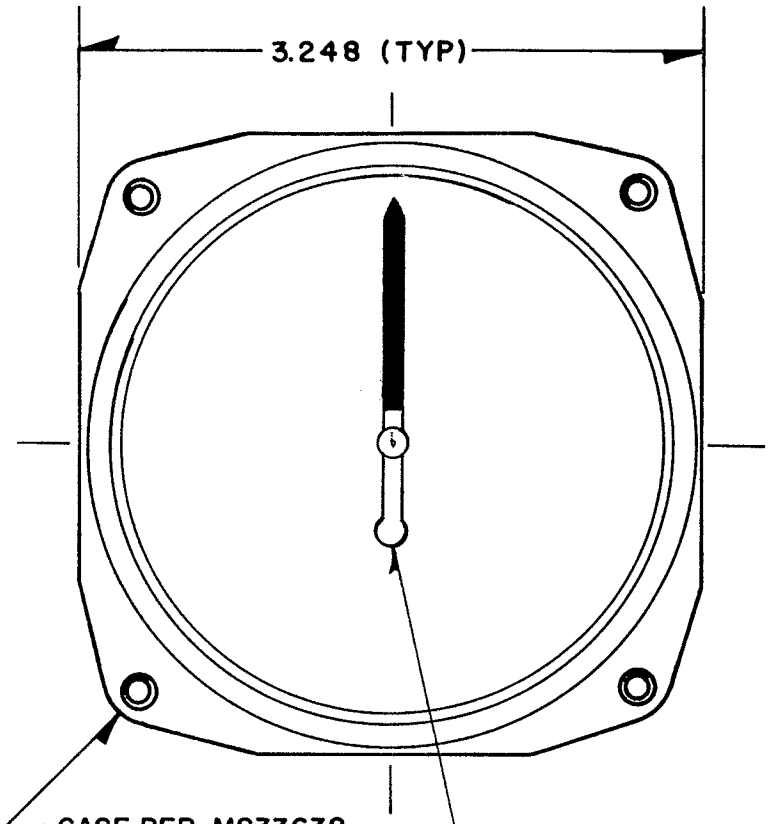
TABLE III
FRICTION ERROR

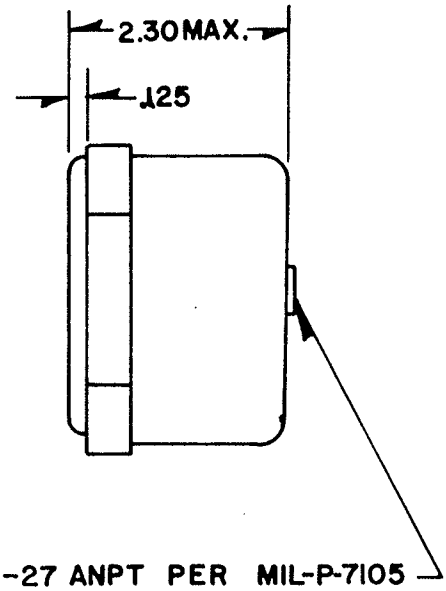
Test Point M.P.H.	U.I. P/N 8000 Tolerance ± M.P.H.	U.I. P/N 8025 Tolerance ± M.P.H.	U.I. P/N 8030 Tolerance ± M.P.H.
50	2.5	- -	- -
90	2.5	- -	- -
100	- -	3.0	3.5
140	2.5	- -	- -
160	- -	3.0	3.5
200	2.5	3.0	- -
220	- -	- -	3.5
250	- -	3.0	- -
300	- -	- -	3.5

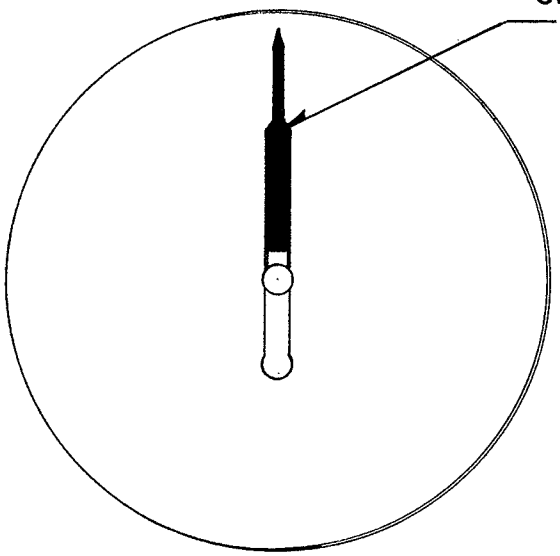
TABLE IV
POSITION ERROR

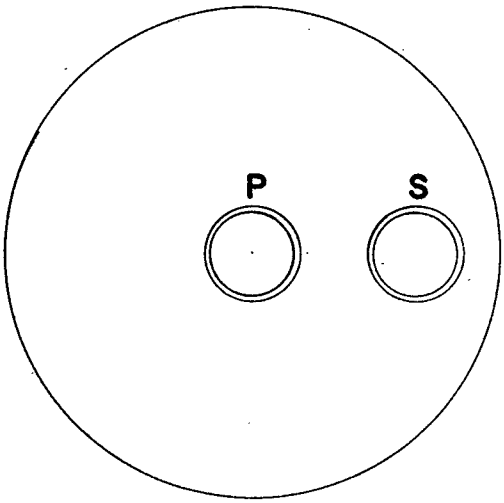
Test Point M.P.H.	U.I. P/N 8000 Tolerance ± M.P.H.	U.I. P/N 8025 Tolerance ± M.P.H.	U.I. P/N 8030 Tolerance ± M.P.H.
60	2.0	- -	- -
100	2.0	2.5	3.0
160	2.0	2.5	3.0
200	- -	2.5	3.0

PART NUMBER	CODE NUMBER	RANGE	DIAL CONFIGURATION
8000	B.1	0 TO 200 M.P.H.	SINGLE SCALE
8000	B.166	0 TO 200 M.P.H.	DUAL SCALE
8025	B.7	0 TO 250 M.P.H.	SINGLE SCALE
8025	B.167	0 TO 250 M.P.H.	DUAL SCALE
8030	B.10	0 TO 300 M.P.H.	SINGLE SCALE
8030	B.168	0 TO 300 M.P.H.	DUAL SCALE









REAR VIEW

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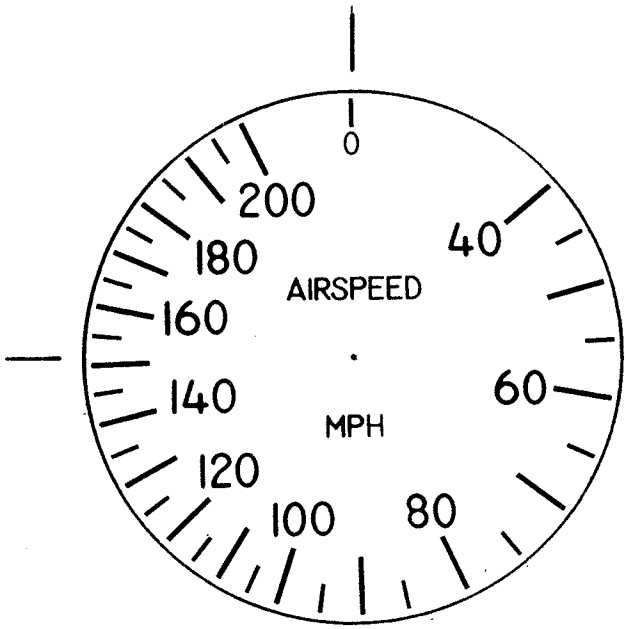
DIAL CONFIGURATIONS 8000



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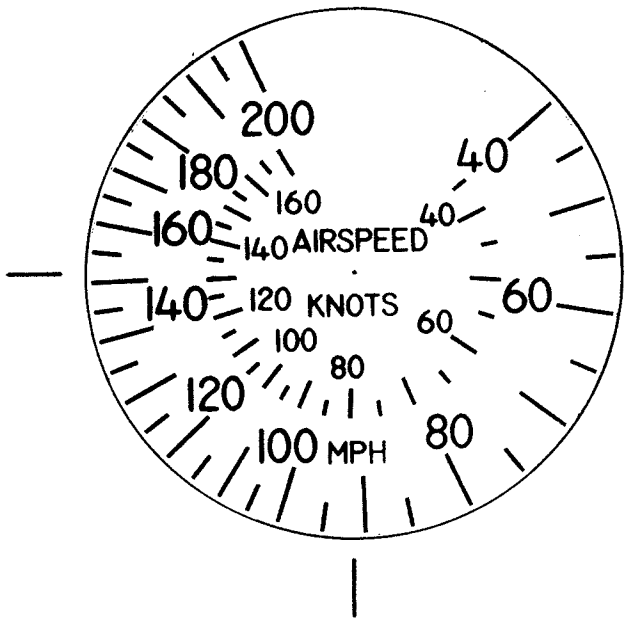

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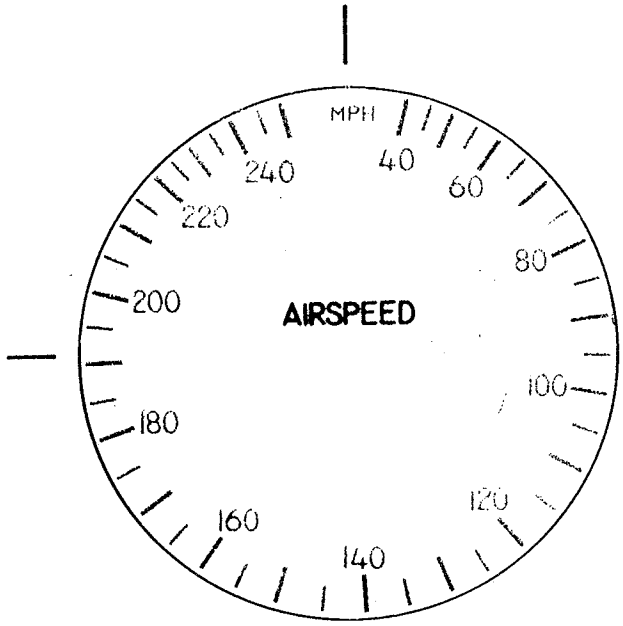
DIAL CONFIGURATIONS 8025



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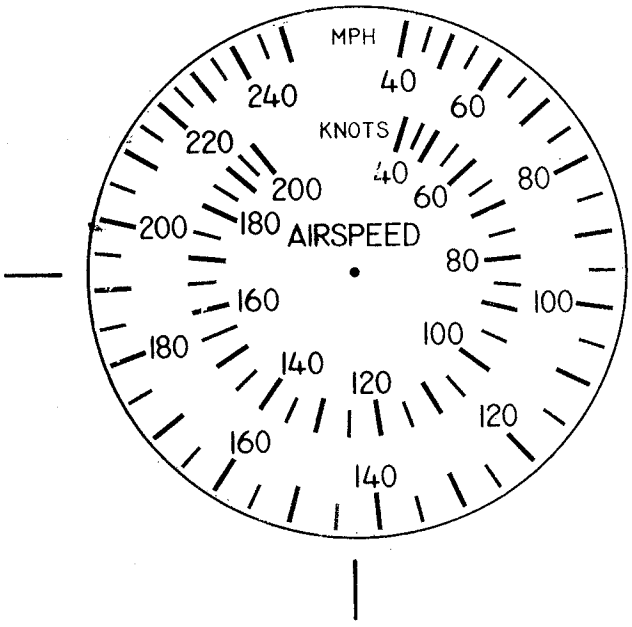

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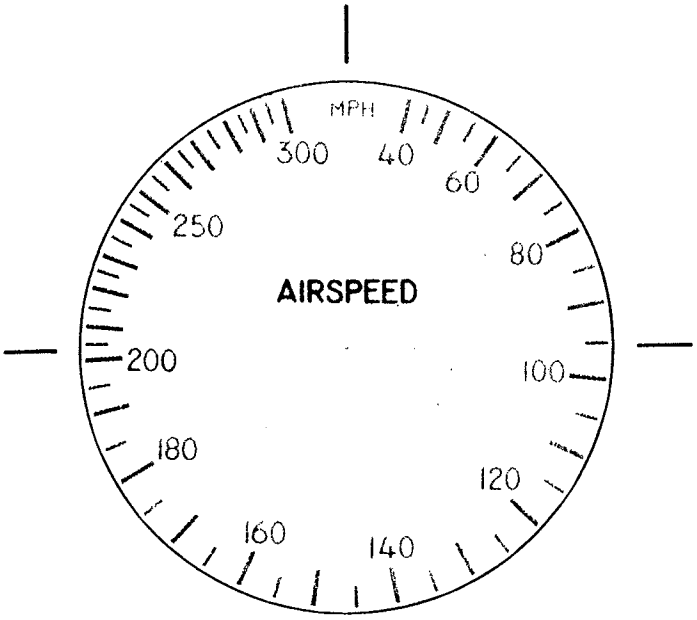
DIAL CONFIGURATIONS 8030



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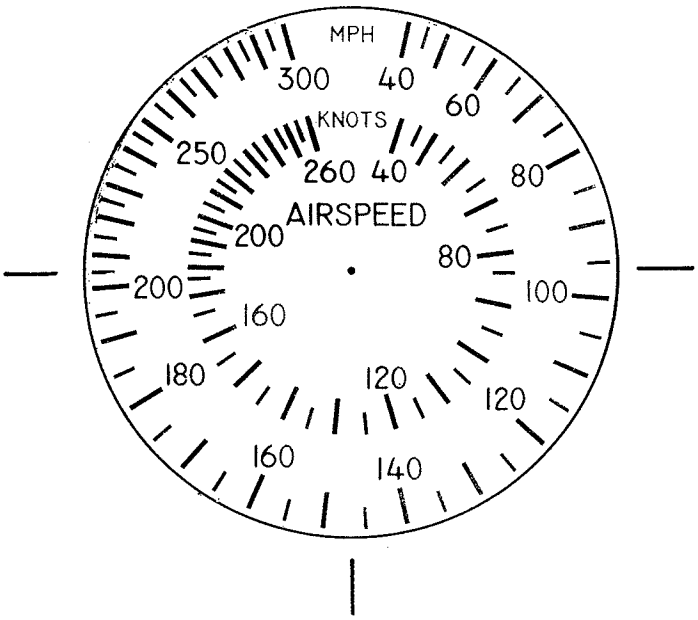

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ADDENDUM

UI SPEC NO. UI8000 PAGE NO. 10A

UNITED INSTRUMENTS, INC.			CUSTOMER		APPRV'D.	
PART NUMBER	CODE NO.	CUSTOMER	PART NUMBER/REV.	CODE NO.	DATE	NOTE
8025	B.778	Classic A/C			12/6/95	Same as B.167, except R/L at 214