1. GENERAL

1.1. PURPOSE: This specification defines standards of minimum performance and conditions under which these standards apply for the Model 7000 Rate of Climb supplied by United Instruments, Inc.

1.2. DESCRIPTION: The model 7000 Rate of Climb is for use on aircraft to indicate the rate of ascent or descent of the aircraft. A Change in pressure due to a change in altitude is represented on the dial in feet per minute, rate of climb or rate of descent. The single pointer indicates zero in level flight. F

Zero is at the 9 o'clock position. Ascent is indicated by a clockwise rotation of the pointer from zero. Descent is indicated by a counter clockwise rotation. Mechanical stops are incorporated to limit pointer travel at the end of the scale.

1.3. OPERATING LIMITS: The Model 7000 Rate of Climb operates through a calibrated range of 0 to 2,000 feet per minute. The Model 7030 Rate of Climb operates through a calibrated range of 0 to 3,000 feet per minute. The Model 7040 Rate of Climb operates through a calibrated range of 0 to 4,000 feet per minute. The Model 7060 Rate of Climb operates through a calibrated range of 0 to 6,000 feet per minute.

1.4. ZERO SETTING SYSTEM: A zero adjustment screw is located in the lower left hand corner of the instrument which provides for a manual setting of the pointer at zero.

2. 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 may 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. F

2.3. POSITION: Unless otherwise specified, all tests shall be made with the instrument mounted in its normal operating position.

3. INDIVIDUAL PERFORMANCE REQUIREMENTS:

3.1. ZERO SETTING RANGE: The range of movement of the pointer by means of the zero adjustment shall not be less than 400 feet per minute for the "Up" and "Down" position.

3.2. SCALE ERROR: When subjected to the rates of change of pressure indicated in (Table I) for the altitude intervals shown, the errors shall not exceed the tolerances specified.

3.3. LAG: Apply a suction or pressure sufficient to obtain a reading of 1800 feet or per minute climb or descent. Rapidly change the suction or pressure to that which will cause an indication of 200 feet per minute. The time required for the instrument to stabilize at 200 feet per minute shall be between 3 and 15 seconds

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				F	7-29-75	UPDATE 1.2, CHANGE 7.2 "SHALL" TO "MAY" SHIFTED 3-3.3 FROM PAGE 2, 4-5.3 FROM PAGE 3		CHECKER		

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3.4. FRICTION: A test shall be performed to ascertain friction. In the time intervals at which the lag times were measured, the pointer shall move smoothly towards zero (while no vibration is applied) and shall return to zero within 300 feet of the initial reading.

3.5. LEAK TEST: The static connection of the indicator shall be joined to a source of suction and pressure and a suitable test standard. Suction or pressure should be applied to the instrument equal to l inch of mercury. The connecting tubing shall be completely sealed. The indicated leak shall not exceed a rate in excess of 100 feet per minute.

3.6. POSITION ERROR: With atmospheric pressure applied to the instrument, the difference between the pointer indication when the instrument is in normal operating position and when it is in any other position shall not exceed 50 feet per minute.

3.7. POINTER OSCILLATION: There shall be no more than 50 feet per minute pointer oscillation when the instrument is subjected to vibration, when mounted in normal operating position, at frequencies to be varied uniformly from 5 to 50 cycles per second at a double amplitude of .020 inches maximum and a maximum acceleration of l.5 g's.

4. ENVIRONMENTAL CONDITIONS: When installed in accordance with United Instruments, Inc. instructions, the rate of climb will function in the following environmental ranges.

4.1. TEMPERATURE: -30 TO 50 C

4.2. VIBRATION:

C.P.S.	MAX. DOUBLE AMPLITUDE	MAX. ACCELERATION
5 TO 50	.020 INCH	1.5 g

4.3. HUMIDITY: 0% TO 95% AT 32°C

4.4. ALTITUDE: The instrument shall function and shall not be adversely affected when subjected to a pressure and temperature range equivalent to -l,000 to 40,000 feet standard altitude, per NACA Report Number 1235, except as limited by the application of paragraph 3.3.l. The instrument shall withstand an external case pressure of 50 inches Hg absolute when installed properly and vent to atmospheric pressure.

5. INSTALLATION INSTRUCTIONS:

5.1. AIRCRAFT STATIC SYSTEM: Must meet the requirements of Federal Aviation Regulations, Volume 5, Part 43, Appendix E.

5.2. CONNECTION: The rate of climb to the static system connection must include a flexible hose or tubing to provide vibration isolation.

5.3. FITTING: The threads of the fitting inserted should be coated to prevent seizing or leakage.

6. WEIGHT: Instrument weight shall be 0.7 lbs.

7. FAA TSO: C8b.

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TABLE I
Scale Error Tolerance

Model 7000 and 7030
(Range: 0-2,000 and 0-3,000 Feet Per Minute)

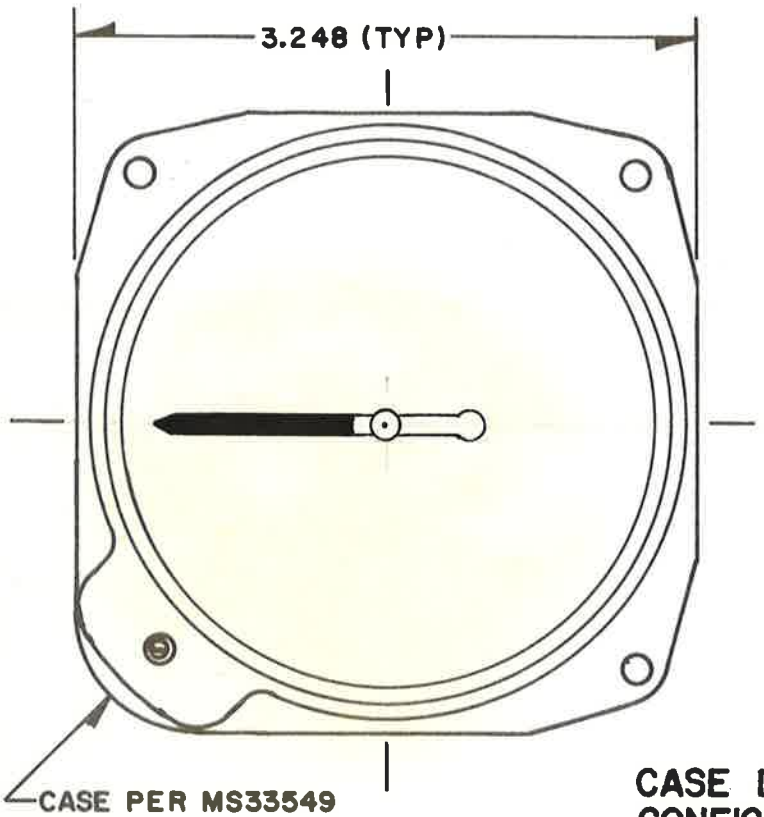
Standard Altitude Test Interval Feet	Test Rate Ascent and Descent Feet per Minute	Tolerance Feet Per Minute
Between 2,000 to 2,500	500	35
2,000 to 3,000	1,000	75
2,000 to 3,500	1,500*	150
2,000 to 4,000	2,000	250
15,000 to 16,500	1,500*	200
15,000 to 17,000	2,000	250
28,000 to 29,500	1,500*	200
28,000 to 30,000	2,000	250

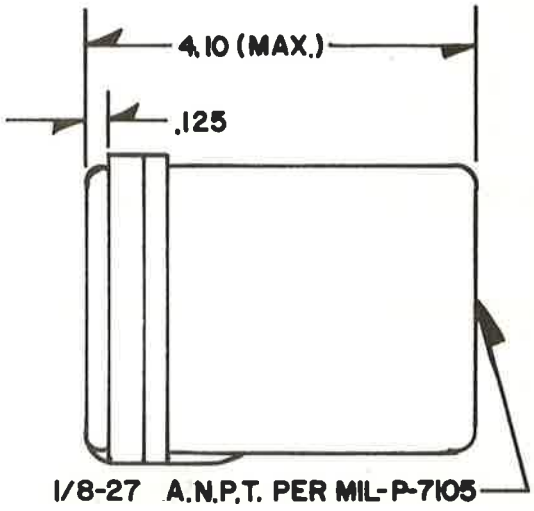
*Maximum test point for Model 7000

Model 7040 and 7060
(Range: 0-4,000 and 0-6,000 Feet Per Minute)

Standard Altitude Test Interval Feet	Test Rate Ascent and Descent Feet per Minute	Tolerance Feet Per Minute
Between 2,000 to 2,500	500	100
2,000 to 3,000	1,000	200
2,000 to 4,000	2,000	300
2,000 to 5,000	3,000*	300
2,000 to 6,000	4,000	400
2,000 to 7,000	5,000	500
15,000 to 17,000	2,000*	300
15,000 to 17,000	4,000	400
28,000 to 30,000	2,000*	300
28,000 to 32,000	4,000	400

*Maximum test point for Model 7040





CASE DIMENSIONS AND POINTER CONFIGURATION FOR THE 7000, 7030, AND 7040, AND 7060

UNITED INSTRUMENTS, INC.

PART NUMBER	CODE NUMBER	RANGE	DIAL CONFIGURATION
7000	C.2	0-2,000 F.P.M.	SOLID
7000	C.31	0-2,000 F.P.M.	SPLIT
7030	C.3	0-3,000 F.P.M.	SOLID
7030	C.27	0-3,000 F.P.M.	SPLIT
7040	C.4	0-4,000 F.P.M.	SOLID
7040	C.28	0-4,000 F.P.M.	SPLIT
7060	C. 46	0-6,000 F.P.M.	SPLIT

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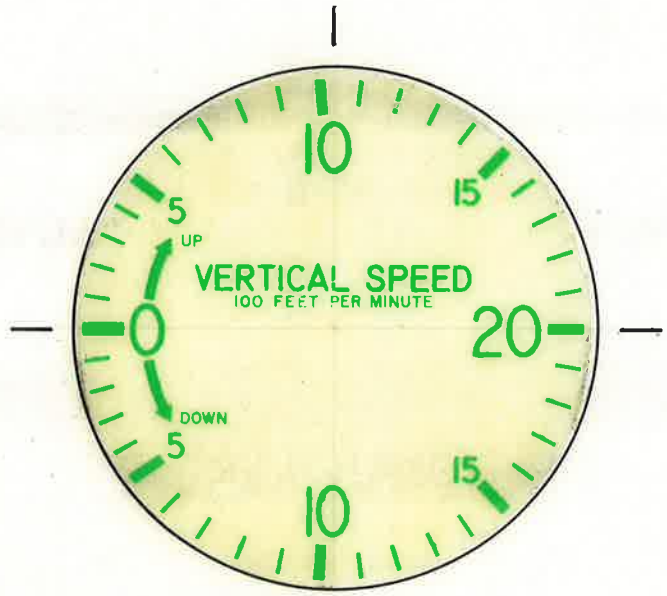
DIAL CONFIGURATIONS 7000



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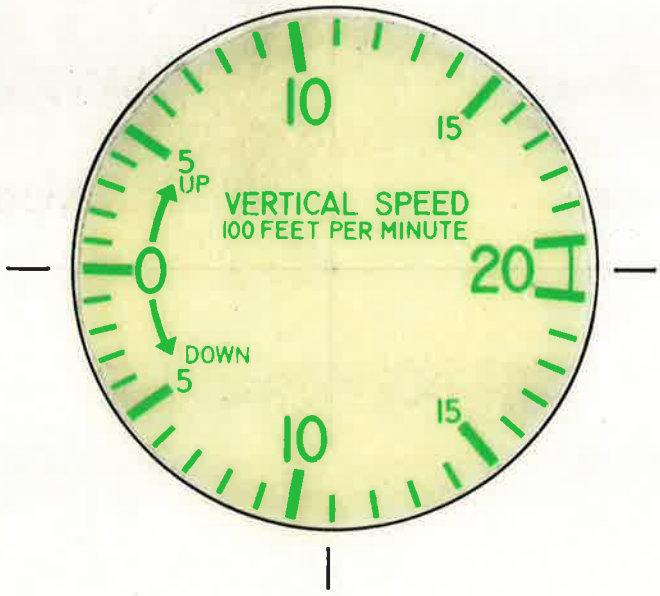

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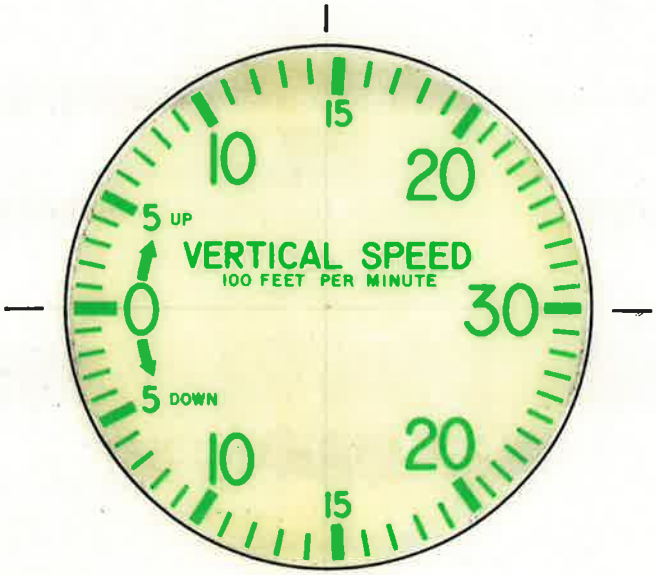
DIAL CONFIGURATIONS 7030



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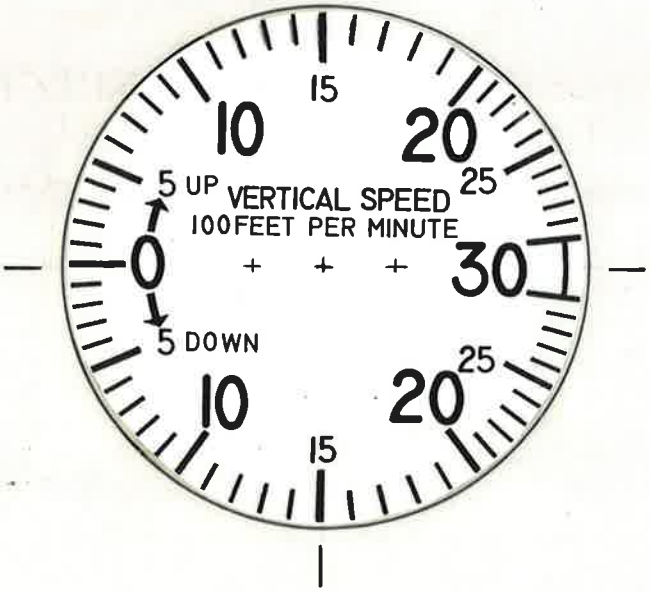

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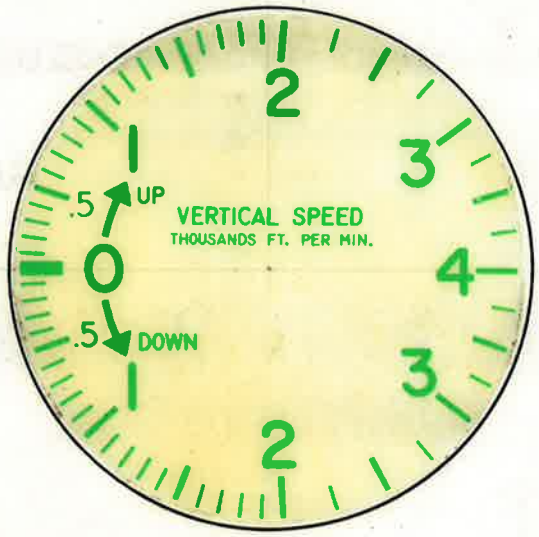
DIAL CONFIGURATIONS 7040



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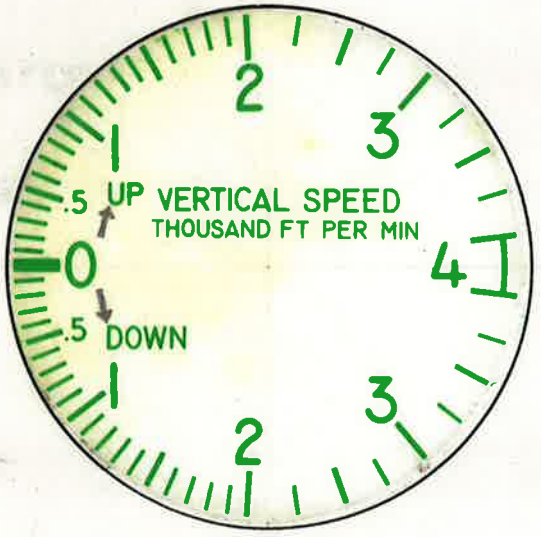

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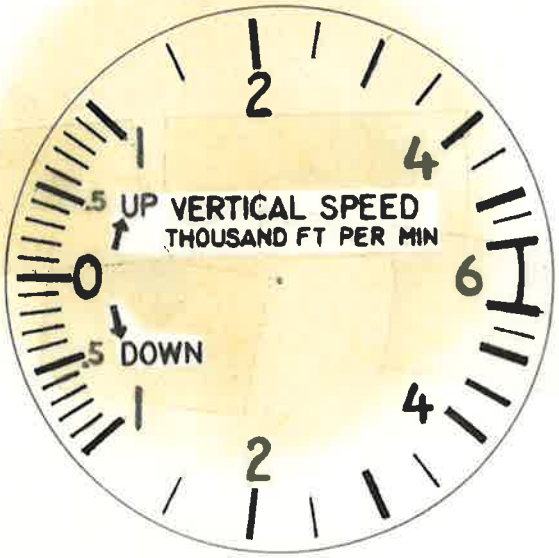
DIAL CONFIGURATIONS 7060



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SUBJECT: Pointer Stoppers

All 7000 series (P/N 7000, 7100, and 7200 series) vertical speed indicators shall have pointer stoppers set at no more than 178 degrees from the zero position. The minimum pointer stop positions shall be within one half the scale error tolerance of the applicable maximum graduation.

For the indicators with separate 'up' and 'down' maximum graduations on the dials, the pointer stops shall be set, so the maximum pointer indication will be within the respective maximum graduations and the pointer will not travel beyond these graduations.

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APPR. BY	T. Stevens	9/12/03
CHECKER		9/12/03
CHK	NAME	DATE

UNITED INSTRUMENTS, INC. 3625 COMOTARA AVE. WICHITA, KS 67226	TITLE: ADDENDUM TO UI7XXX SERIES SPECS	SPEC. NO: UI7XXX-ADD-1	ISSUE A
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