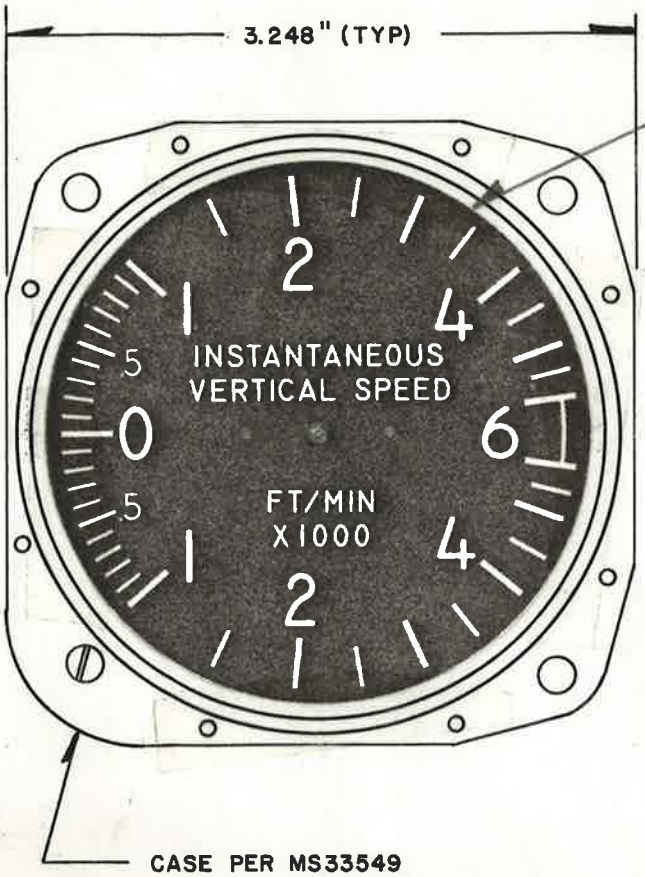
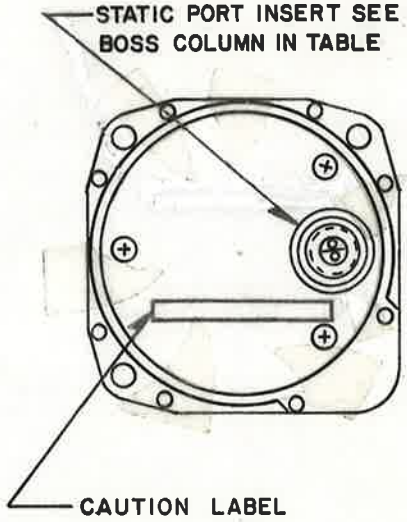
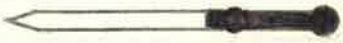


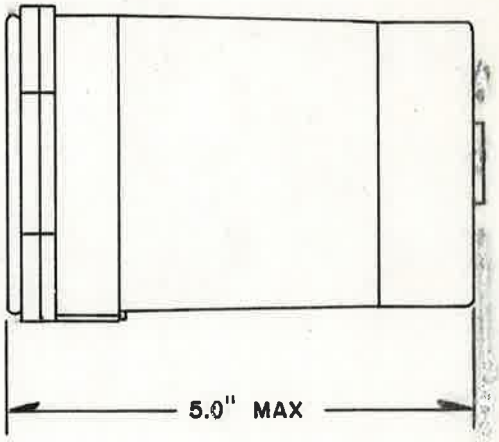
6000 FPM RANGE, PART NO. 7160,
CODE NO. C.43 DIAL CONFIGURATION SHOWN





POINTER CONFIGURATION

UI		RANGE FT PER MIN	BOSS
PART NO.	CODE NO.		
7120	C.40	0 TO 2000	MS33649-4
7130	C.41	0 TO 3000	
7140	C.42	0 TO 4000	
7160	C.43	0 TO 6000	MS33649-6



WT: 1.4 LBS

REV.	DATE		CHK.	REV.	DATE		CHK.		NAME	DATE
E	8-1-25	J.2 CHG "SHALL" TO "MAY"	RC	C	4-21-81	RELOCATED PRESS PORT & ADDED DIAL CONFIG. FOR C.41 THRU C.42	T.K.	PREP. BY		
D	7-288	CHGD TIME REQMT IN ITEM 3.7 (PG.3)	T.K.	B	11-1-79	SEPARATE C/N FROM P/N	T.K.	APPR. BY		8/9/76
				A	9/27/76	Rev. 3.3 Log		CHECKER		

UNITED INSTRUMENTS, INC.

3625 Comotara Avenue
Wichita, Kansas 67226

TITLE: INDICATOR, INSTANTANEOUS VERTICAL SPEED, ACCELERATION SENSITIVE - MODEL 7100

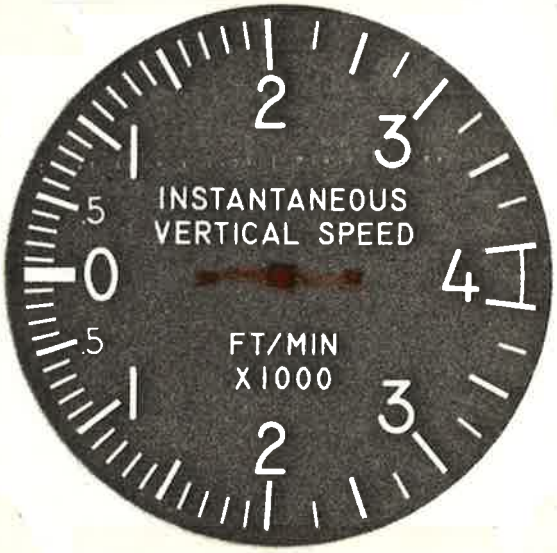
SPEC. NO: UI 7100

ISSUE E

UIE-10

2000 FPM RANGE
PART NO. 7120
CODE NO. C.40

3000 FPM RANGE
PART NO. 7130
CODE NO. C.41



4000 FPM RANGE
PART NO. 7140
CODE NO. C.42

1. GENERAL

1.1. PURPOSE: This specification defines standards of minimum performance and conditions under which these standards apply for the Model 7100 Acceleration Sensitive Instantaneous Vertical Speed Indicator supplied by United Instruments, Inc.

1.2. DESCRIPTION: The model 7100 Vertical Speed provides an anticipated indication of an aircrafts rate of climb. Ascent shall be indicated by a clockwise rotation of the pointer from zero. Descent is indicated by a counter clockwise rotation. Zero is at the 9 o'clock position. Stops shall be incorporated to limit pointer movement at the end of the scale.

1.3. OPERATING LIMITS: The Model 7120 Vertical Speed operates through a calibrated range of 0 to 2,000 feet per minute. The Model 7130 operates through a calibrated range of 0 to 3,000 feet per minute. The Model 7140 operates through a calibrated range of 0 to 4,000 feet per minute. The Model 7160 Vertical Speed 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. E

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: The natural lag of the instrument when timed between 1800 and 200 feet per minute (Model 7120 & 7130) or 2000 and 200 feet per minute (Model 7140 & 7160) shall be between 3 and 15 seconds.

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: With a suction of 15 inches of mercury applied to the static pressure connection, the leakage shall not cause more than 0.05 inches of mercury pressure drop during a 1 minute period. With a pressure of 10 inches of mercury applied to the static connection, the leakage shall not cause more than 0.05 inches of mercury pressure drop during a 1 minute period.

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 Acceleration Response: This test shall be performed with vibration and the pointer adjusted to coincide with the zero graduation. With the instrument resting in the normal operating position, roll it over to an inverted position. The pointer shall indicate a maximum down reading of 2300 ± 500 feet per minute. It shall hold this maximum reading and then suddenly break and return to zero. The time from "roll over" to "break" shall be 3.5 ± 1 seconds, and from "break" to "500 feet per minute" graduation shall be 2.5 ± 1 seconds. With the instrument still in an inverted position, and the pointer at zero, rapidly roll the instrument over to its normal position. The time from "roll over" until the pointer returns to the 200 feet per minute graduation shall be 20 ± 6 seconds.

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

4.1 Temperature: -30°C to 50°C

4.2 Humidity: 0% to 95% at 32°C

4.3 Vibration:

Cycles per Second	Max. Double Amplitude	Max. Acceleration
5 to 120	.036 In.	1.5 g
120 to 500		.5 g

4.4 Altitude: The instrument shall function and shall not be adversely affected when subjected to a pressure and temperature range equivalent to -1,000 to 40,000 feet standard altitude, per NACA Report Number 1235, except as limited by the application of paragraph 4.1. The instrument shall withstand an external case pressure of 50 inches of Hg absolute when installed properly and vented to atmospheric pressure.

5.0 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 Vertical Speed to the static system connection must include a flexible hose of tubing to provide vibration isolation.

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

TABLE I

Scale Error Tolerance

Model 7120

Standard Altitude Test Interval (feet)	Test Rate Ascent and Descent (feet/min)	Tolerance (feet/min)
2,000 to 2,500	500	35
2,000 to 3,000	1,000	75
2,000 to 3,500	1,500	150
15,000 to 16,500	1,500	200
28,000 to 29.500	1,500	200

Model 7130

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

Model 7140

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
15,000 to 17,000	2,000	300
28,000 to 30,000	2,000	300

Model 7160

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

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.

REV	DATE		CHK	REV	DATE
A	11/10/03	chngd min ptr stop	TO		

PREP. BY	I Reed	9/12/03
APPR. BY	T. Lawrence	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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