VSI200E Vertical Speed Indicator with Altitude Encoder

THIS IS A TRANSPORT CANADA APPROVED MANUAL

The following checklist outlines the required articles for the VSI200 Vertical Speed Indicator.

	Documentation	Document Number
☐	Introduction (this document)	S200-VSI200E-001
☐	Warranty Statement	S200-AWS
☐	Installation Instructions	S200-VSI200E-002
☐	Wiring and Installation Schematic	S200-VSI200E-INST
☐	Setup Guide	S200-VSI200E-004
☐	Operations Guide	S200-VSI200E-005
☐	Product Specifications	S200-VSI200E-006
☐	Installation Compliance	S200-VSI200E-007
☐	Authorized Release Certificate	FORM ONE

Components

- ☐ VSI200E Instrument
- ☐ 4 X Mounting Screws

NO NONSENSE WARRANTY

Our warranty policy is simple …. It is even written in plain English!

Please read it BEFORE DOING ANYTHING WITH YOUR NEW INSTRUMENT!

If you require technical support when installing your instrument please call our Technical Support department directly on
416-628-0725

We will:

- Repair or replace (at our discretion) any instrument which becomes defective within a period of 12 (twelve) months of manufacture date. You will pay for the shipping costs to return the instrument to us and we will pay for the shipping costs to return the instrument to you;

- Replace all instruments that fail out of warranty for a flat rate of 50% of the cost of a new instrument, at the time of the failure.

We are not:

- Liable for any costs associated with the installation or removal of any of our instruments, irrespective of the cause;

- Liable for any misuse or non-use of the instrument in whatever form.

We will not:

- Repair or replace your instrument free of charge, under warranty, if it has not been installed by an appropriately licensed person.

If you do not agree with ANY of the above statements, return your new instrument to us immediately for a FULL refund LESS shipping costs.

ALL RETURNS REQUIRE RETURN MATERIAL AUHORIZATIONS (RMA). WE DO NOT ACCEPT RETURNS WITHOUT RMA NUMBERS. CALL 416-628-0725 FOR AUTHORIZATION.

VSI200E Installation Instructions

1. Connect the wiring supplied with the DB25 interface connector in accordance with the VSI200E Wiring and Installation Schematic. **DO NOT ATTACH THE CONNECTOR TO THE INSTRUMENT UNTIL ALL WIRING HAS BEEN CONNECTED.**

2. Select the instrument location in the aircraft panel.

3. Ensure that the aircraft master switch and/or power to the instrument is **OFF**.

4. Attach the aircraft static line to the 1/8" NPT instrument static port.

5. Attach the DB25 connector to the instrument. Ensure that the plug is fully inserted into the instrument. Finger tighten the two plug locking screws, then tighten 1/8 turn using a screwdriver. **DO NOT OVERTIGHTEN.**

6. Install the instrument in the panel, attaching with four 6-32 X 5/16" screws.

7. Initial Power Up Sequence:

    a. Adjust the instrument intensity control for maximum intensity.
    b. Apply power to the instrument.
    c. The instrument display will light up.
    d. Turn the instrument **OFF**.

8. If the instrument display does not light up:

    a. Ensure intensity control is set for maximum.
    b. Turn off power.
    c. Disconnect the DB25 connector from the instrument.
    d. Check intensity control.
    e. Check the wiring installation and breaker or fuse.

9. Complete an aircraft static line leak test, if required.

10. Proceed to "Instrument Setup".

VSI200E Vertical Speed Indicator with Altitude Encoder

The Fastest Way to Install and Start Using this Product

NOTE: *This product is certified as a primary replacement, new or secondary instrument only when installation is performed in accordance with the documented instructions and procedures.*

1. Review the Warranty Statement before performing any tasks. Do not remove the instrument from the sealed package until you agree with the stated terms.

2. VSI200E is TSO'd to C8e with additional testing as an electronic Vertical Speed Indicator. As such, it may replace any existing TSO C8e Vertical Speed Indicator that does not exceed use above 35,000'. It connects, without any changes, to the existing aircraft static system. It does not contain any non-TSO'd functions.

   The encoder is TSO'd to C88b and provides both Gray Code and ICARUS 10' resolution outputs.

   For all other vehicles, aircraft that do not have a TSO C8e Vertical Speed Indicator as required equipment, experimental aircraft and new OEM installations you are required to confirm applicability for use.

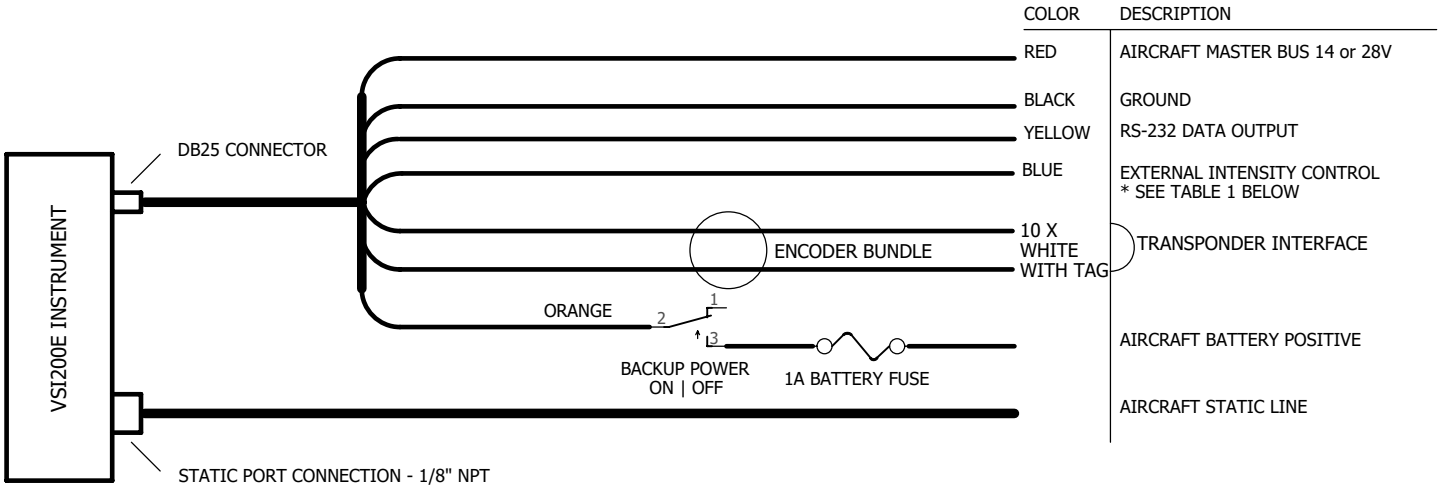
3. Follow the Installation Instructions exactly as noted, referring to the Wiring Diagram as and when required. Note: The installation process has been optimized based on the sequence of components to be installed. Installing the product in any other way will, in all likelihood, take longer and be more complex.

4. Perform the Instrument Setup as noted in the Instrument Setup Guide.

5. Validate that all functions perform as outlined in the Operations Guide.

6. Complete all regulatory documentation, if required.

Aerospace Logic Inc.
VSI200E Wiring and Installation Schematic



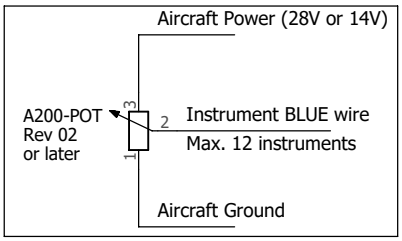
INSTALLATION NOTES:

1. Allow for current drain of 0.150A (150mA)
2. RED WIRE - Connect using a dedicated breaker or panel fuse for primary power
3. ORANGE WIRE - Switched, direct connection to aircraft battery positive using a 1A inline fuse (installer to supply). Connect the fuse as close as possible to the battery terminal.

TABLE 1 - INTENSITY CONTROL OPTIONS

Day VFR Only	Connect BLUE wire to power bus (14V or 28V)
ALL OTHER FLIGHT CONDITIONS	Connect BLUE wire to panel rheostat only if the rheostat output is as follows: 0V for lowest intensity operation, AND Bus voltage for highest intensity, AND Bus voltage for daylight operations.
	If the panel rheostat does not function as above then use Aerospace Logic potentiometer Part # A200-POT and connect per Table 2

TABLE 2 - A200-POT CONNECTION



THERE ARE NO INSTRUCTIONS FOR CONTINUED AIRWORTHINESS APPLICABLE TO THIS PRODUCT

THERE IS NO FLIGHT MANUAL SUPPLIMENT APPLICABLE TO THIS PRODUCT

THIS PRODUCT IS CERTIFIED FOR USE AS BOTH A PRIMARY AND SECONDARY FLIGHT INSTRUMENT

VSI200E Setup Guide

The only available user setup options are to select the maximum climb/descent rate. Options are:

- 2000 fpm
- 3000 fpm
- 4000 fpm
- 6000 fpm

To enter the setup start with the instrument turned off.

Press and hold the top button and apply power at the same time.

Once the selection menu appears, release the top button.

Press the bottom button to sequentially move between options.

Once the desired option is selected press the top button to save.

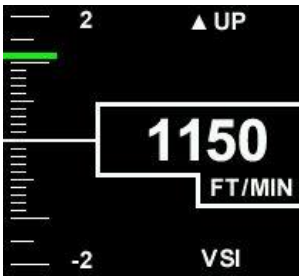
The instrument will restart with the selected climb/descent rate.

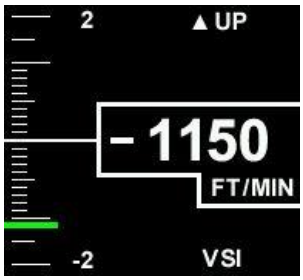
WARNING

All flight operations are to be performed in accordance with the specific instructions pertaining to your aircraft, including those provided by the aircraft manufacturer.

The VSI200E VSI is certified as a primary replacement or for secondary use as appropriate.

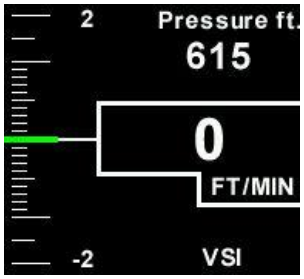
VSI200E Operations Guide





The green pointer on the VSI tape denotes the direction of travel (climb or descent) as well as the rate in a graphical form.

The digital display provides the rate of climb or descent. The " – " sign in front of the rate value further indicates a descent condition.



By pressing the bottom button the Pressure Altitude (relative to 29.92inHg / 1013.25mb) is displayed. When the button is released the display reverts to the default display.

INTERNAL INTENSITY CONTROL

Press and hold the top button for 5 seconds to activate the Dimmer Control menu.

Select the "Up Arrow" and press the top button to disable external intensity and increase intensity.

Select the "Down Arrow" and press the top button to decrease the intensity and enable external intensity control (if connected).

Select the "Save" option and press the top button to save your selection and return to normal operations.

The Dimmer Control menu is not available during instrument setup

ALTITUDE DATA

Altitude data is transmitted automatically to the specific device/s and is transparent to the operator.

AIRCRAFT MASTER BUS POWER FAILURE

In the event of an aircraft master bus failure, turn on the backup power switch to retain operation of the instrument. Do not operate the instrument with both primary and backup power energized. In the backup mode the instrument external intensity control is disabled and a fixed intensity is provided. Internal intensity control remains available.

All flight operations are to be performed in accordance with the specific instructions pertaining to your aircraft, including those provided by the aircraft manufacturer.

The VSI200E vertical speed indicator with pressure altitude encoder is certified for primary replacement or secondary use.

VSI200E Product Specifications

Certification / Compliance		
TSO	C8e, C88b	
SAE	AS8016A, AS8003	
Environmental	DO-160E C1CAASXXXXXXYBXXBBBCSBA1C11XXAX	
Software	DO-178B, Level C	
DC Power Source	Input voltage	6 to 36 VDC
	Power consumption	125mA
	Load dump tolerance	+60V
	Direct spike tolerance	+/- 60V
	Cable spike tolerance	> +/- 1KV
Operating Temperature	Constant operating	-20ºC to +55ºC
	Short term operating (1hr)	-40ºC to +70ºC
	Storage	-55ºC to +85ºC
Display Units	Rate of climb/descent	Feet per minute
	Standard Pressure Altitude	Feet
Display Ranges	Standard Pressure Altitude	-1,000ft to 35,000ft
	Rate of climb/descent	0 - 2,000’ 0 - 3,000’ 0 - 4,000’ 0 - 6,000’
Accuracy	Demonstrated	+/- 1ft
	Certified (Exceeds)	SAE AS Standards
Display	Sunlight readable LCD 80/80/80/80 Degree viewing angle	
RS-232 Altitude Data	ICARUS format, 10’ resolution	
Encoder Output	ICAO Standard Code for SSR Pressure Altitude	
Interface Connector	Electrical	DB-25
	Static Port	1/8” NPT
Software Functionality		
Primary Display	Rate of climb/descent	
Secondary Display	Rate of climb/descent & standard pressure altitude	
Setup	Select maximum climb/descent rate	
Dimensions		
Enclosure	2.45” X 2.45” X 0.96”	
Including pressure port	2.45” X 2.45” X 1.725” (maximum dimension point)	
Weight (excluding harness)	4.30 oz	
Finish	Black anodized 6061 aluminum	

VSI200E Product Specifications

Performance Specification Statement per AS8003 Section 4.4

a) Entire instrument power requirement is 125mA. The encoder section is capable of sinking (grounding) and maximum of 1.15A of current (115mA X 10 outputs).

b) The encoder shall interface to transponder units for which the following Gillham Grey Code Outputs are acceptable (most Mode C transponder units):

1. Each encoder lead is a sink driver that will ground up to a 60V input. Minimum voltage is 3V.

2. Each encoder lead will sink a constant current of 115mA. Minimum current requirement is 525uA.

3. Maximum ON impedance is less than 3 Ohms.

4. Maximum ON (logical “1”) voltage is 60V. Minimum is 3V.

5. Leakage current for (4) above is less than 100nA

6. Maximum OFF (logical “0”) voltage is 0.6V. Minimum is 0.12V.

7. Maximum rate of altitude change is 100mS.

8. Switching bandwidth is greater than 1,000 kHz.

Provides standard 10-Bit Code.

VSI200E Installation Compliance

1. TSO LODA Compliance Statement

   "The conditions and tests required for TSO approval of this article are minimum performance standards. Those installing this article either on or within a specific type or class of aircraft must determine that the aircraft installation conditions are within the TSO standards which include any accepted integrated non-TSO function standards. TSO articles and any accepted non-TSO function(s) must have separate approval for installation in an aircraft. The article may be installed only according to 14 CFR part 43 or the applicable airworthiness requirements." FAA LODA dated JUN 11, 2014.

2. Installation Procedures and Limitations

   Installation must be in accordance with the following VSI200E published documents:

   a. VSI200E Wiring and Installation Document (S200-VSI200E-INST)
   b. Instrument Setup (S200-VSI200E-004).

3. Installation Location and Visibility

   The VSI200E is to be installed in existing panel holes and to replace existing instrumentation. As primary and secondary replacement products they must be placed in the same panel location as the original equipment. Their visibility and placement relative to other instruments are the same or similar to the existing instruments. Where they are installed in a different location it is the responsibility of the installer to ensure that the necessary approvals are obtained prior to returning the aircraft to service.

4. There are no components (instrument or harness) that require ongoing maintenance to ensure airworthiness.

5. No additional maintenance requirements are specified after the installation.

6. No component maintenance or repair is performed on any component of the system. In the event of failure the failing device is replaced in its entirety.