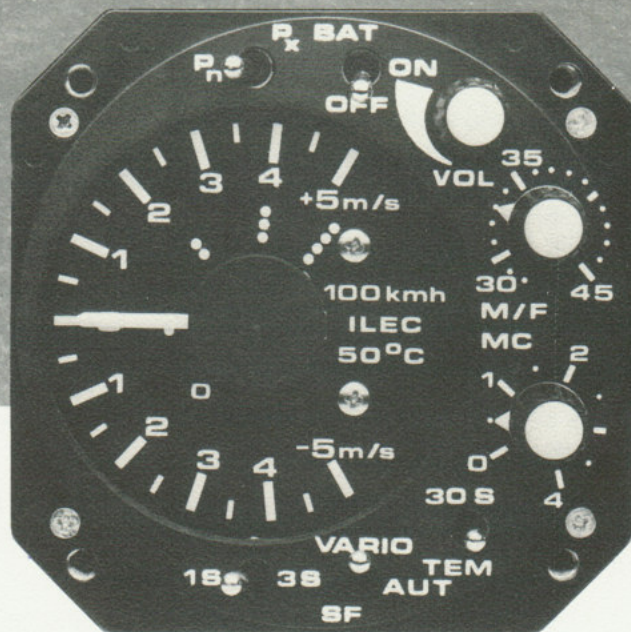


SB-8



Electronic variometer with speed command

- Electronic variometer with total energy compensation by a TE tube
- Professionally made in Germany
- Excellent zero stability and accuracy
- Two different electronic filters can be selected by the pilot according to weather conditions and his needs
- Integrator, outside air temperature and battery indicator
- Vario multitone audio tells you meter reading very clearly with its tonality programmable in several ways
- Automatic volume control for pilot comfort
- SB-8 combines with a variety of auxiliary meters
- Speed command computer which really works
- Normal and „dirty” polars, continuously adjustable McCready and wing loading values
- Automatic muting of audio signals when cruise speed is correct
- Switching between climb and cruise can be done by flaps or remote switch
- Complete system contained in standard 80mm diameter case
- Easy to install
- Polarity protected and no radio interference
- Detailed user manual with many helpful hints
- Bolt-on ILEC ASR distance counter and glide computer

ILEC

Industrie- und Luftfahrtelctronik GmbH
Friedrich-Puchta-Str. 6 · 95444 Bayreuth · Tel. (0921) 13733 · Fax (0921) 82731

SB-8 Description of the System

The SB-8 uses the well proven system of measuring the air flow between a flask and a TE probe. The air speed signal is obtained by measuring the air flow through a capillary between Total and TE pressures. The patented transducer has great zero stability and high linearity of measurement through a wide temperature range, giving fast reaction and immediate availability when switched on. The SB-8 requires no zero adjustment.

Integration of all essential elements in a single 80mm case, meter, speaker and flask with all controls on the face provides for simple installation and great system reliability. The modular design and vibration resistant construction ensure operation under the most severe conditions.

SB-8 Variometer Displays

The 1 second response gives a fast but well damped signal which is particularly suited for centering in thermals. Short disturbances by vertical and horizontal gusts are strongly suppressed. The 3-second response, (similar to that of a good moving vane variometer), is there for pilots who prefer it.

Visual indication of the vario signal is on a circular meter with a 240 degree scale. The meter range is sufficient for the vertical speeds normally found in Europe but is sensitive enough to indicate the weakest useable thermals.

The useable scale of the audio is ± 30 kts. This lets the pilot monitor vertical speeds that are outside the range of the visual indicator.

The base frequency of the audio signal increases exponentially with vertical speed. Its base pitch is modulated by a slow frequency which varies with the rate of climb. At zero climb this frequency is reduced to zero producing a continuous tone. In sink the modulation rate (frequency) is constant at 1 per second. This audio, thanks to its double frequency, makes it possible to estimate vertical speed accurately to within 1kt in a range of ± 6 kts without having to look at the meter. One can easily hear a change of 0,25kts.

Audio sound can become an irritant during long flights. Help is at hand . . . the SB-8 is equipped with a basic sound consisting of 3 tones of different pitch. This sound is easier to listen to than the normal single tone sounds. The normal interrupted tone, single and double tone audio sounds are available should they be required.

SB-8 Speed Command Computer

The speed command computer calculates the optimal cruise speed on the basis of the polar selected, wing loading, McCreech values and the momentary vertical speed.

Normal and „dirty” polars can be independently programmed and selected with the Pn/Px switch. The polar of the glider is represented by a parabola. The parameters of the parabola determining cruise speed are programmed internally by digital switches. These programmes can be adapted to new conditions at any time. Wing loading may be set continuously in the range 4 to 10 lbs/sq ft. This allows for a wide range of water and pilot ballast. McCreech values can be set continuously on the vario face in the range 0 to 9kts.

In the speed command mode the difference between the air speed actually flown and the momentary optimal cruise speed is shown directly as a difference in air speed with a range of ± 60 kts. With this information the pilot can adjust the glider's airspeed to the optimal cruise speed effectively. This contrasts with the current speed command systems which simply indicate a difference in „sink to fly”. Here the pilot does not know how much change of airspeed to apply as the ratio of „sink to fly” to „air speed to fly” varies greatly with airspeed. With the SB-8 speed command computer this function, which is essential to the control system of pilot and glider, is unaffected by airspeed. In addition time delays in signal handling have been designed so that the control system is as dynamically stable as possible. Practical experience with the SB-8 has proved that the work load for controlling cruise speed has been considerably reduced in comparison with other systems where one often „chases” after the correct airspeed.

In the speed command mode the same tone appears as in climb but with spread increased around zero to accentuate the difference between the signals for „too fast” and „too slow”. As long as the air speed actually flown is within a tolerance band, (adjustable from 0 to ± 15 kts around the optimal speed), the audio remains muted. As the tolerance limit is approached the high or low pitch signal appears with increasing volume.

The audio is designed so that one can thermal with the speed command mode set. Remember however that the response rate is the 3-second one and that the zero has been moved.

SB-8

Futher Features of the SB-8 System

Integrator:

A push button will display the running average vertical speed (vario average) of the last 25 seconds on either the SB-8 or an ancillary meter.

Automatic volume control:

The audio signal volume is automatically adjusted to the glider's speed and the background noise: low volume at low speed . . . higher volume at high speed.

Automatic mode switching:

In AUT on the CRUISE/CLIMB switch changes can be made automatically via a flap actuated switch or by a remote control

Battery indicator:

A push button on the instrument face will show the battery's residual charge.

Outside air temperature:

A push button will also show the outside air temperature in a range ± 50 degrees C.

Electrical protection:

The instrument is protected against reverse polarity.

Pneumatic connections:

Thanks to the built in electronic filters no capillaries or other devices are required. A small plastic fuel filter will help to keep out dust and moisture in adverse conditions.

Auxiliary meters:

There are many meter combinations available some examples are shown below.

Recalibration is not necessary since all ILEC instruments are individually calibrated in the factory.

SB-8 only:

Indicator meter is switched between VARIO and SPEED COMMAND depending on the mode selected. The INTEGRATOR reading is shown on the meter by a push button.

One 80mm panel opening is required.

SB-8 + 1 RAZ meter:

SB-8 shows SPEED COMMAND or INTEGRATOR as selected, the VARIO signal is always shown on the RAZ meter.

RAZ meters with up to three different scales are available.

SB-8 + DAZ meter:

SB-8 shows VARIO signal, the INTEGRATOR and SPEED COMMAND are shown separately on the DAZ vertical double scales. All information is thus permanently displayed.

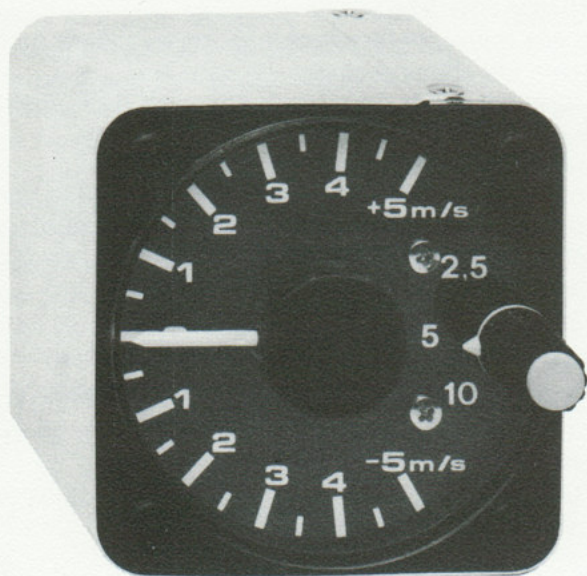


SB-8 Technical Data:

Supply Voltage	: 11 to 15 Volts (works down to 9 Volts)
Consumption	: 40mA at medium audio volume, 90mA max
Dimensions	: 83×83×215mm (80mm standard case) Panel depth, instrument 157 mm + 40 mm for connector
Weight	: 0,8 kg
Temp Range	: Operating: -30 to $+60$ degrees C.
Scales	: Measurement : ± 30 kts Audio : ± 30 kts Meter : ± 10 kts
Zero Accuracy	: $\pm 0,3$ kts from -10 to $+50$ degrees C
Calibration	: Electrical : $\pm 2\%$ at 4000ft
Variometer	: Meter : $\pm 3\%$

SB-8

SB-8 System Ancillaries

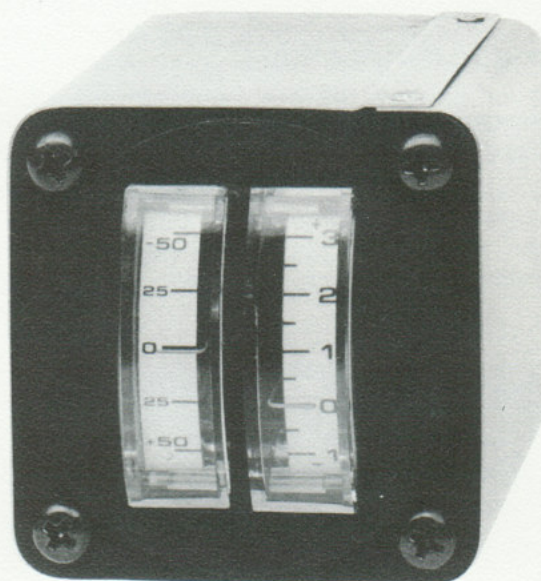
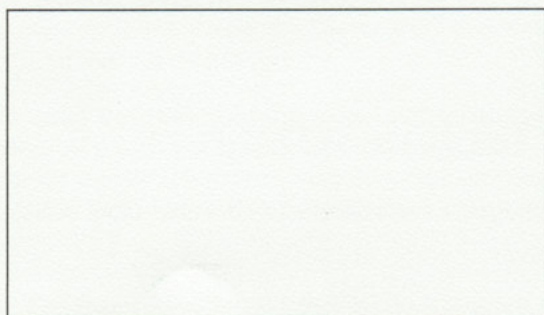


RAZ (10kts) 240 degree circular meter with a fixed scale of ± 10 kts (Integrator, Variometer or two seater remote).

RAZ-3(knots) 240 degree circular meter with three switchable ranges ± 5 kts; ± 10 kts; ± 30 kts, used as a variometer

DAZ (knots) Double vertical flat band meter for speed command and intergrator, ranges ± 30 kts; -2 kts to $+6$ kts

In two seaters meters can be connected in parallel to instruments in the front panel.



ILEC Total Energy Probes

The well proven ILEC TE probes have a quick release coupling with an O-ring for 6mm or 8 mm fitting. They are made of specially manufactured light alloy tube which is anodised, corrosion resistant, light weight, tough and they oscillate little. They are insensitive to slip, have a precise pressure coefficient and very little self generated noise. They give the quietest vario signal and precise measurement of speed for the speed command computer. The standard fitting is for mounting on the tail fin. Special versions are available for fuselage mounting.

ALL INSTRUMENTS ARE GUARANTEED FOR TWO YEARS