POWER
PLUS

Installation & Operating description (1-8)

Monterings & Bruksanvisning (9-15)

Installation & Bedienungsanweisung (16-23)

Description d´installation et d´utilise (24-30)

Silva Power Plus is part of an unique instrument system-basically designed for motor boats and is offering a variety of possibilities. To enable you to get the most out of your instrument,we have produced this manual which we ask you to study carefully.

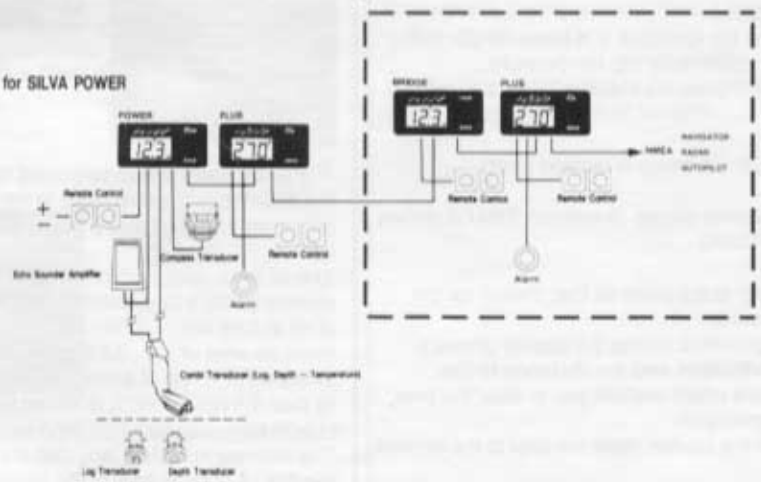
Contents:

1. General

POWER PLUS is an additional instrument to **Silva POWER**. The instrument processes data from POWER and is an excenllent navigation aid, specially for boats not equipped with a Loran or simular.

Note! The instrument must be calibrated for your boat. Study the instruction in chapter 3 and then calibrate.

Connection diagram for SILVA POWER



2. How to use the POWER PLUS instrument.

2.1 Choice of functions:

POWER PLUS offers the following functions:

- Distance to the desired track = **TRACK**
- Distance made good /course made good : **DMG/CMG**
- Depth and anchor alarm = **DEPTH/A**
- Shallow alarm = **SHALLOW**

depending on which transducers are connected to the main instrument **POWER**.

The selected function is indicated by the arrow at the upper edge of the display. The arrow is moved either to the right or the left by pressing the buttons (to the right use the right button, to the left use the left button). Secondary functions (chapter 2.2 Functions) are obtained by pressing both buttons simultaneously when the arrow is in the selected position.

2.2 Functions

In describing the functions, it is taken for granted that the transducers for log, temperature, depth and compass are connected and properly installed.

2.2.1 TRACK (distance to desired track)

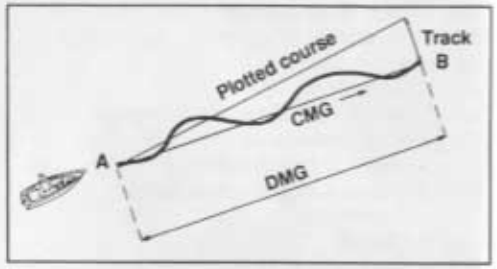
When no desired course is entered, **TRACK** shows actual **HEADING**

The damping is the same as that chosen for the main instrument.
With a programmed course the display shows a **steering indication and the distance to the desired track** which enables you to steer the boat with great precision.
To program the course, steer the boat to the desired course.

Then press both buttons simultaneously.

The course is shown flashing on the display.
If necessary, correct the desired course by pressing the right button (increase) or the left button (decrease).
Then press both buttons simultaneously.
The desired course is now programmed. The **DMG** and **CMG** memories are reset to zero for "dead reckoning". (See A principle drawing).

The diagram of navigating with POWER PLUS.



The display now shows estimated **off track error**, ie the distance in Nautical miles to the desired/pro - grammed track and also a steering indication symbol.
The off track error is shown with a floating decimal comma giving a precision of 1/100 Nm at maximum error of 0,99 Nm.
From an error of 1,0 - 9,9 Nm the precision is indicated in 1/10th of a mile and with an error of more than 9,9 Nm the error is shown without decimals (10-99 Nm).
The steering indication is shown on the display by a symbol ↱ or ↰ in front of the off track value.

Exemple:

↱ ,05 = steer to starboard (distance to desired track 0,05 Nm)

↰ 1,3 = steer to port (distance to desired track 1,3 Nm)

There is also an **off course alarm** which is activated when the error is greater than the programmed course. This alarm value is set in the calibration routine. See chapter 3.

To disconnect **TRACK** and **off course alarm,** press both buttons simultaneously until the display shows the heading. Clearing the off course alarm can be done by steering the boat to the right course, change to another function or disconnect **TRACK**.

2.2.2 DMG/CMG

This function is used in order to determine your posititon departing from a known point (dead reckoning).

Program the desired course in **TRACK** at a known position (see A in the diagram). The **DMG** and **CMG** memories are reset to zero for dead reckoning.

Measurement range 0,00 - 9,99 Nm
and then 10,0 - 99,9 Nm

The display shows **DMG** (Distance from latest known position) in Nautical miles. See B in the diagram.

Then press both buttons simultaneously.

The display shows **CMG** (steered course from latest known position). See B principle drawing.

When the instrument is switched on, the DMG and CMG memories are always on zero.

Important! The log and compass in the POWER instrument must be carefully calibrated. The instrument does not take into account drift and current.

2.2.3 Depth/Anchor alarm.

With the function arrow on **Depth/A** the depth is shown in meters, feet or fathoms. The unit is the same as that programmed in the main instrument **POWER**.

By pressing both button simultaneously the anchor alarm is activated.

The arrow on **ALARM** is lit and the text "**Anchor**" appears on the display.
Then the actual depth is shown for 4 sec and the text "**Anchor**" is shown again.

If a temperature transducer is connected the seawater temperature will be shown alternately with the depth.

If the depth changes more then ± 20%, an alarm will be given.

Clearing and disconnecting the anchor alarm is made by changing to another function.

2.2.4 SHALLOW

With the function arrow on **SHALLOW** the display will show the latest programmed alarm depth in the same unit as that of the main instrument **POWER**.

Example:

Programming of the alarm depth is done by *pressing both buttons simultaneously.*

Exemple:

The last programmed alarm depth will flash.

Choose a new alarm depth by pressing the right button (**increase**) or the left button (**decrease**).

Then press both buttons simultaneously. The programmed alarm depth will now be stored in the memory (10 years memory) and the arrow on **ALARM** will be lit.

The alarm is now activated.

Clearing the **ALARM** is done by pressing any of the buttons after steering into deeper water.

2.2.5 Illumination (Lit)

Press the right or left button until "**Lit**" appears on the display.

Then press both buttons simultaneously to switch on/off.

3. Calibration

In order to have the instrument working correctly, the log calibration value of **POWER** must be transmitted to **POWER PLUS**.

This operation only needs to be carried out once. The entered values are memorized even if the power is cut.

3.1 Off course alarm and log calibration

The calibration consists of two steps. Both steps must be run through in order to revert to normal funtion.

(to advance = *press both buttons simultaneously).*

START! Press the right or left button until **Lit** is shown on the display, then press both buttons simultaneously until **CAL** appears.

1. Off course alarm

Alarm range 1° - 99°
00 = disconnected.

When the buttons are released **A00** = off course alarm will appear. To change the alarm value, press the right or left button until the chosen maximum off track value in degrees is displayed.

Then press both buttons simultaneously.

2. Choice of calibration value for the log

Example:

The display shows the calibration value for boatspeed.

Program the same calibration value as programmed in the main instrument **POWER**.
Then press both buttons simultaneously and the instrument is ready for use.

4. Parts specification

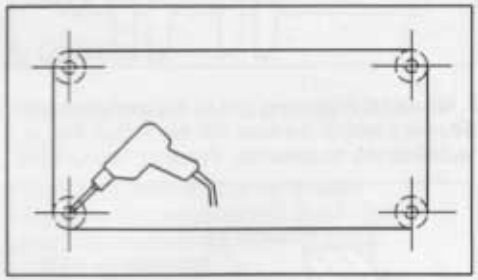
The SILVA POWER PLUS instrument comes with all necessary fittings and attachments for most installations. Check each part prior to installation.

1 # Operating manual
1 # Instrument
1 # Gasket
1 # ALARM 105 db with 2 m (6½") cable
1 # Connection cable POWER 0,5 m (3,2")
1 # Template
4 # Nuts (M5)
1 # Backplate
1 # Cover plug
4 # Nut caps

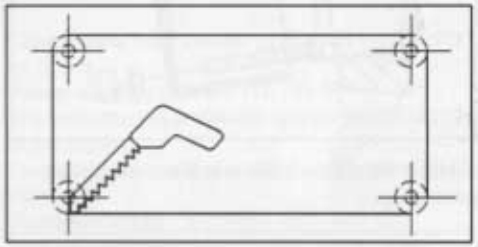
5. Installing the instrument

The instrument must be mounted on a smooth surface.

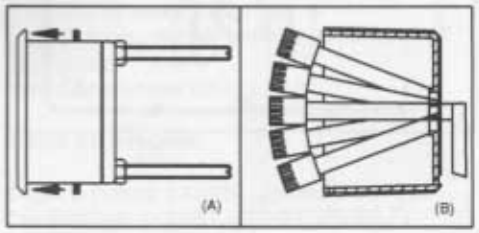
1.Use the template supplied with the operating manual. Attach it to the desired location, drill with a 4 mm (5/32") bore and then a 10 mm (3/8") bore.



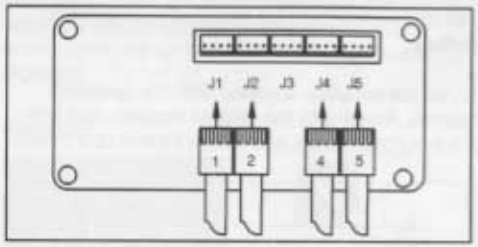
2. Saw along the dotted line (use blade for glassfibre/porcelain/ceramics of type AEG k 50 fine). Note! Do not saw outside the dotted line!



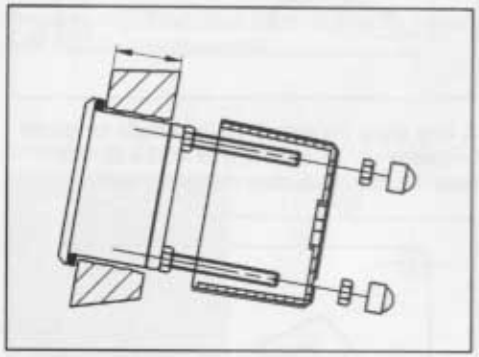
3. Mount the gasket over the instrument. (A) Pass the cables through the backplate. (B)



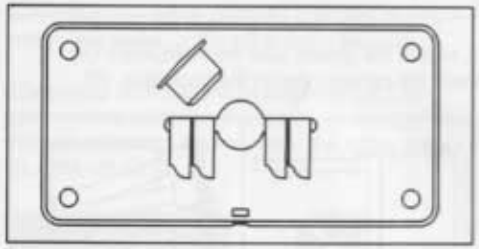
4. Connect the cables to the instrument according to chapter 6.



5. Mount the instrument and fix the backplate with the nuts supplied (be sure that the slots in the backplate are downwards). Press on the nut caps.

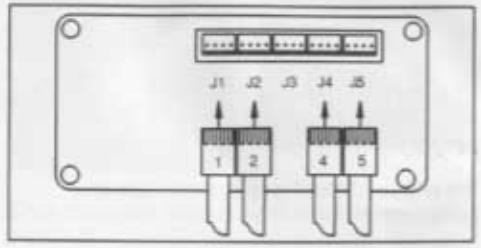


6. Move the cables aside and press on the red cover plug.



6. Connection diagram/contacts.

The instrument has 5 contacts marked J1, J2, J3, J4, J5. Each contact has 4 connectors.



J1 = Remote Control (option see separate connection diagram)

Connector 1 Green + 12 V
Connector 2 Yellow remote control down/left
Connector 3 White remote control up/right
Connector 4 Brown 0 V

J2 = **Aux** (alarm)

Connector 1 Red + 12 V
Connector 2 -
Connector 3 Black alarm
Connector 4 -

J3 = **not in use**

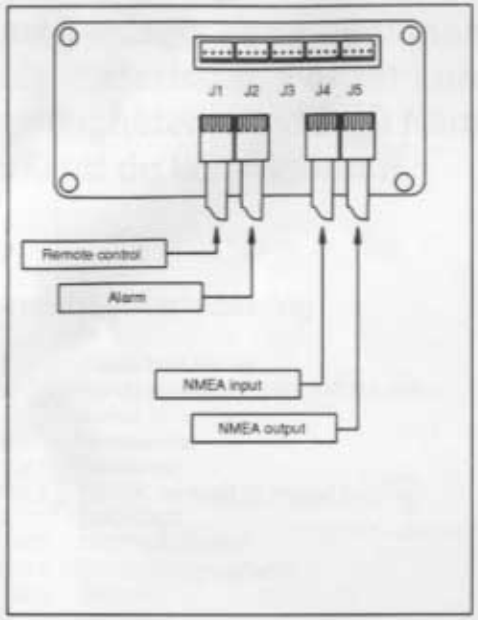
J4 = **NMEA 0183** data input (from **POWER** or **POWER PLUS**).

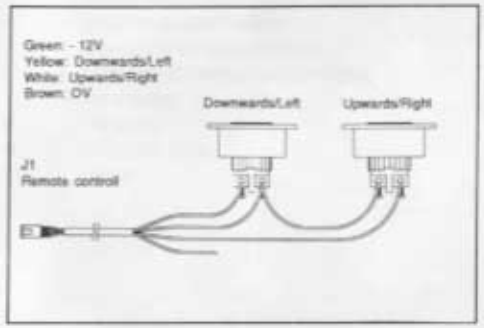
Connector 1 Green + 12 V
Connector 2 Yellow log pulse
Connector 3 White NMEA input data
Connector 4 Brown 0 V

J5 = **NMEA 0183** output data (to **POWER BRIDGE**, **POWER PLUS** or **NAVIGATOR**).

Connector 1 Green + 12 V
Connector 2 Yellow log pulse
Connector 3 White NMEA output data
Connector 4 Brown 0 V

Connection diagram





7. Fault finding

In most cases the reason for faults in an electronic instrument is a faulty connection, so first check the connections according to the diagram.

Also check:
- sufficient battery voltage
- cables for damage
- faulty contact in connectors
- the fuse is not blown and is of the right type.
- the transducers are correctly installed.

Automatic fault finding is indicated each time the instrument is switched on and is shown on the display.

E02 = Memory error
"- - -" = Fluxgate transducer not connected.
=Depth transducer not connected or no echo.
=Temperature transducer not connected or defective.
=Below or over the temperature range.

8. Options

The following items can be supplied as optional extras:

Power remote control art.no 20266.
Data cable for navigators etc. art.no 19962.
Other instruments in the **POWER** range:
POWER art.no 20107
POWER BRIDGE art.no 20110
POWER NAVIGATE art.no 20111.

9. Technical data

Dimensions instrument: 62,5 x 125 mm (2 15/32" x4 15/16")
Power supply: 12 V DC (10 - 18 V)
The instrument is protected against misconnection of the battery.
Current consumption: 8 mA (with illumination 25 mA)
Template range: Operation -10° - +70°C
Storage -30° - +80°C
Input data: NMEA 0183. Data format 8 databits (D07 = 0) no parity, 2 stopbits
Output data: NMEA 0183. Data format 8 databits (D07 = 0) no parity, 2 stop bits
Output alarm: Anchor alarm, shallow alarm, off track alarm.
Instrument cable: 0,5 m (3,2 ft.)

NMEA 0183 record:

Depth in meters: $XXDBT,,,0000.0M,,(CR)(LF)
Depth in feet: $XXDBT,0000.0,f,,,,(CR)(LF)
Depth in fathoms: $XXDBT,,,,,000.0,F(CR)(LF)
Vector: $XXVHW,000,T,000,M,00.00,N,,(CR)(LF)
Heading: $XXHDM,XXX,M,(CR)(LF)
Water temperature: $XXMTW,-00,C,(CR)(LF)
sign prefix only if minus

10. Warranty

SILVA Sweden AB gives a two year warranty against manufacturing faults or faulty components. A purchasing receipt must be shown if a warranty claim is made. The warranty does not apply to damage caused by careless handling, faulty installation nor for damage caused by not fusing the instrument according to the instructions. The warranty does not apply to secondary damage caused by faults in instruments or transducers. The right to change the specification is reserved by the manufacturer.