

Distributed by
Raymarine

Any reference to Raytheon or RTN in this manual should be interpreted as Raymarine. The names Raytheon and RTN are owned by the Raytheon Company.

Autohelm[®]

**ST 50
PLUS**

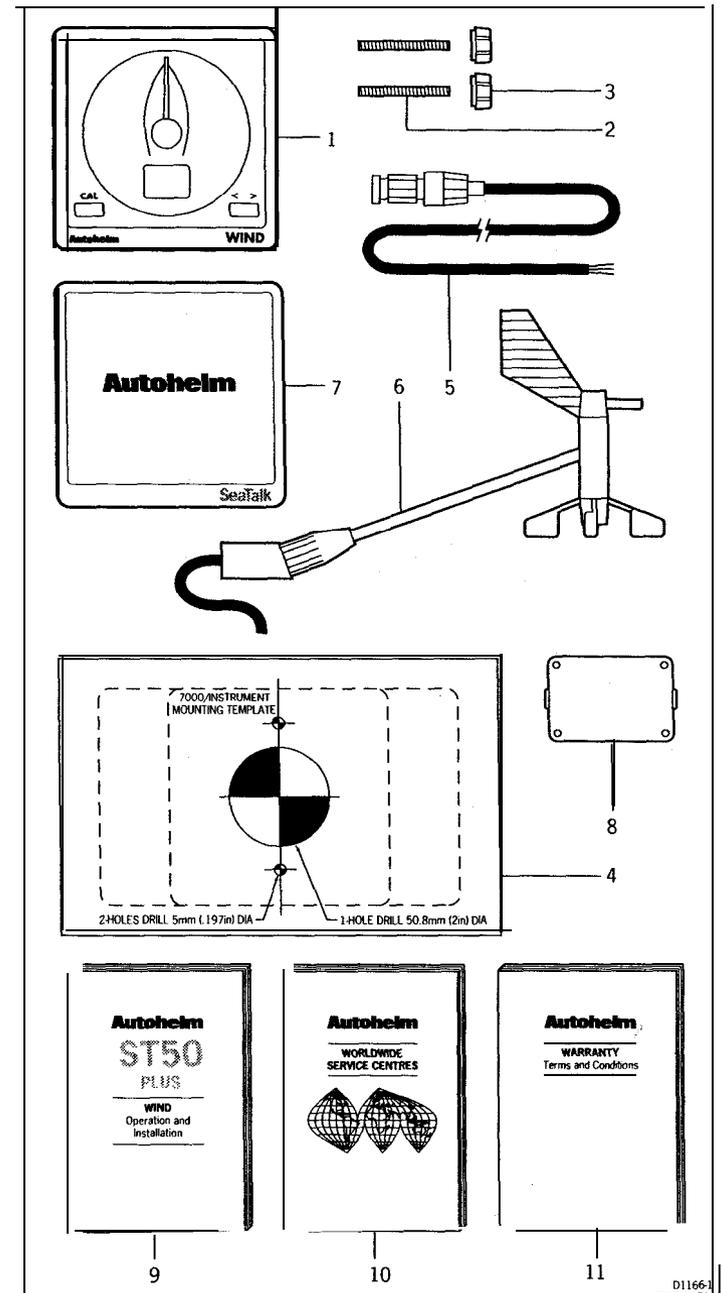
**WIND & CLOSE
HAULED/VMG**

Operation and
installation

Package Contents

The following items are included in the ST50 Plus Wind package:

1. ST50 Plus Wind control head
2. Fixing studs (2 off)
3. Thumb nuts (2 off)
4. Fitting template
5. Power cable
6. Masthead transducer
7. Control head cover
8. Junction box
9. Operation and Installation handbook
10. Worldwide Service Centre handbook
11. Warranty document



Contents

Introduction	1
Chapter 1: Control Head Installation3
1.1 Sing	3
1.2 Mounting Procedure	4
1.3 Power Supply (stand-alone operation)6
1.4 Power Supply (SeaTalk operation)	6
1.5 Connection of Separated Instruments7
1.6 Ring Connection	8
1.7 Connection to SeaTalk Compatible Autopilots8
Chapter 2: Transducer Installation	9
2.1 Connection to the Control Head	9
2.2 Masthead Transducer Installation	9
Chapter 3: Fault Finding and Maintenance	11
3.1 Fat&Finding..11
3.2 Maintenance12
Chapter 4: Operation	13
4.1 True/Apparent Wind Selection	14
4.2 Illumination	14
Chapter 5: CODE Lock Security	15
5.1 Security Code	15
Chapter 6: Calibration	17
6.1 Initial Calibration	18
6.2 Extended Calibration	20
Chapter 7: General Specification	23
Chapter 8: Close Hauled/VMG25
8.1 Package Set	25
8.2 Operation	26
8.3 Installation and Maintenance26

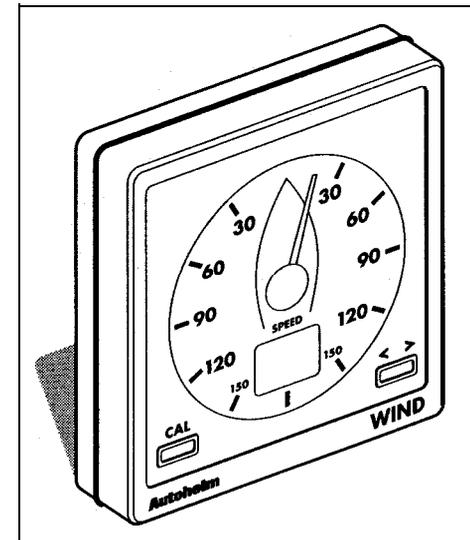
Introduction

The ST50 Plus Wind instrument features a 360 degree apparent wind scale and a sensitive yet stable needle drive that delivers accurate information under even the most demanding conditions.

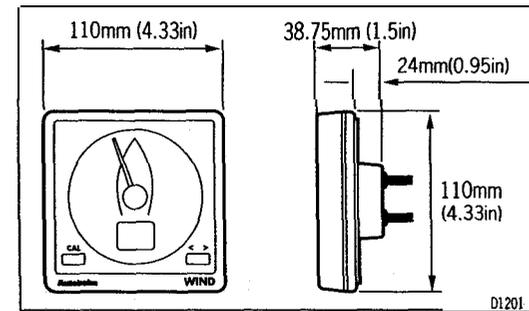
The unit can be configured to operate as a master or a dedicated repeater unit. When used as a master the unit displays data received directly from the masthead transducer, whereas repeater mode displays wind information already on the SeaTalk bus.

These instruments also incorporate a security feature to protect units mounted in vulnerable areas, such as the cockpit, helm or mast.

Thank you for purchasing an **Autohelm** product. May we take this opportunity to wish you years of trouble free operation.



Chapter 1: Control Head Installation



1.1 Siting

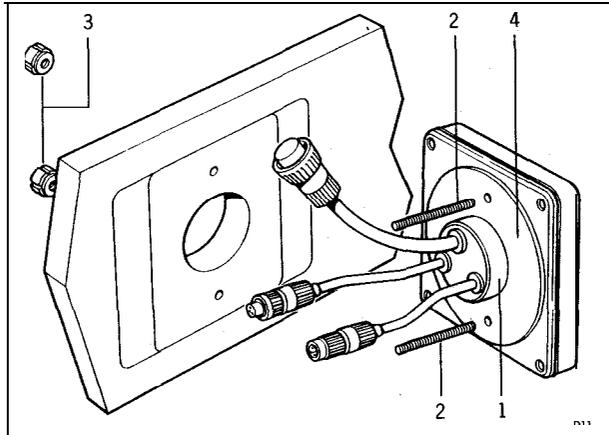
The ST50 Plus Wind is designed for above or below deck installation where it is:

- Easily read by the helmsman
- Protected against physical damage
- At least 230mm (9in) from a compass
- At least 500mm (20in) from radio receiving equipment
- Accessible from behind for ease of installation and cable running.

Caution:

To prevent moisture forming on the display window, the unit 'breathes' through a small vent in the cable boss. Therefore, the control head must be sited where the rear case is protected from contact with water.

The rear case is fitted with a foam gasket to form a water-tight seal between the instrument and the selected installation face.

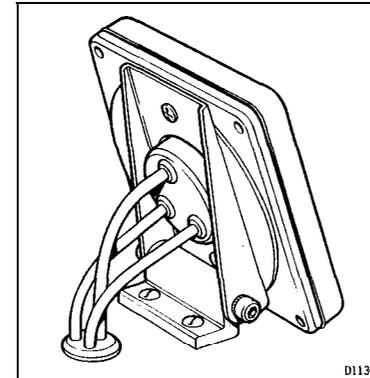


2 Mounting Procedure

1. Make sure that the selected location is clean, smooth and flat.
2. Apply the self-adhesive template (supplied) to the selected location and mark the centres for the fixing studs (2) and the cable boss (1).
3. Drill two 4mm (5/32in) clearance holes for the fixing studs (2) through the bulkhead. Remove the template.
4. Cut the clearance hole for the cable boss (1) using a 50mm (2in) diameter cutter.
5. Screw the two fixing studs (2) into the control head.
6. Pass the SeaTalk cable and transducer tails through the cableboss (1) clearance hole.
7. Assemble the control head to the bulkhead and secure from behind using the thumb nuts (3).

Bracket Mounting

The ST50 Plus Wind can, as an alternative, be bracket mounted using the Autohelm Mounting Kit.

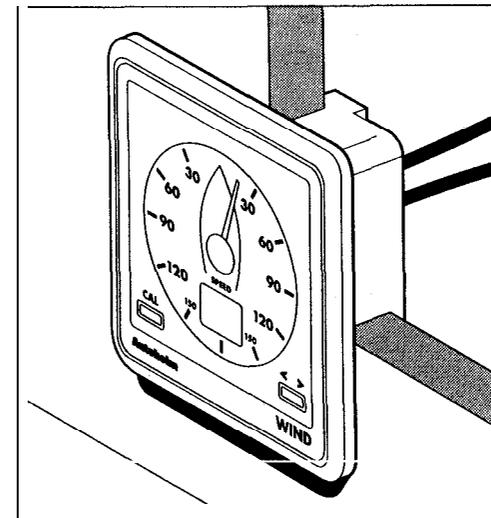


Note:

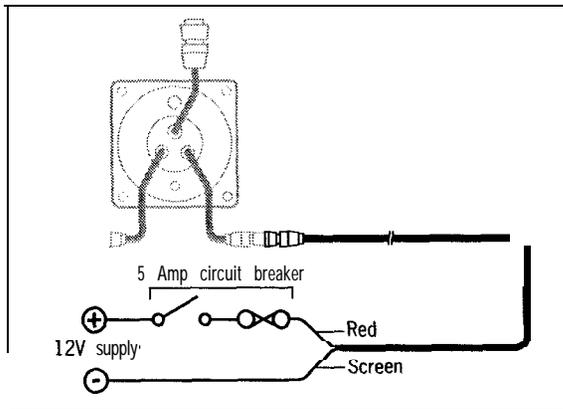
Because the instrument breathes through the vent in the rear case, this bracket is for interior use only.

Flush Mounting

A flush mounting kit is available for installations where a flush mount is required or more desirable. Full installation instructions are provided with the kit.



3 Power Supply (stand-alone operation)



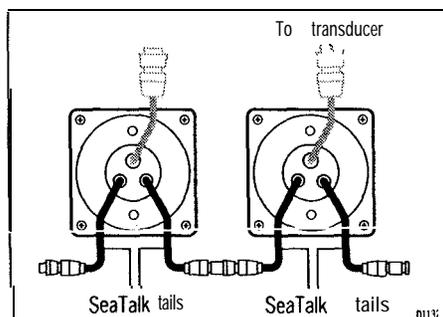
1. Connect the 2m (6ft.) power supply cable to the distribution panel.
2. Cut the cable to length and connect the red wire to the +12V terminal and screen to the 0V terminal.
3. Cut back and insulate the yellow wire.
4. Protect the circuit with a 5A circuit breaker.

Note:

Longer runs to the power supply can be made using the 9m (30ft) SeaTalk Extension Cable (D131).

Power Supply (SeaTalk operation)

All instruments in a SeaTalk system receive power and information from the SeaTalk bus. Each instrument has two SeaTalk connectors (3 pin) on 150mm (6in) tails. To supply power and information to the instrument simply plug the adjacent instrument tails into the ST50 Plus tails.

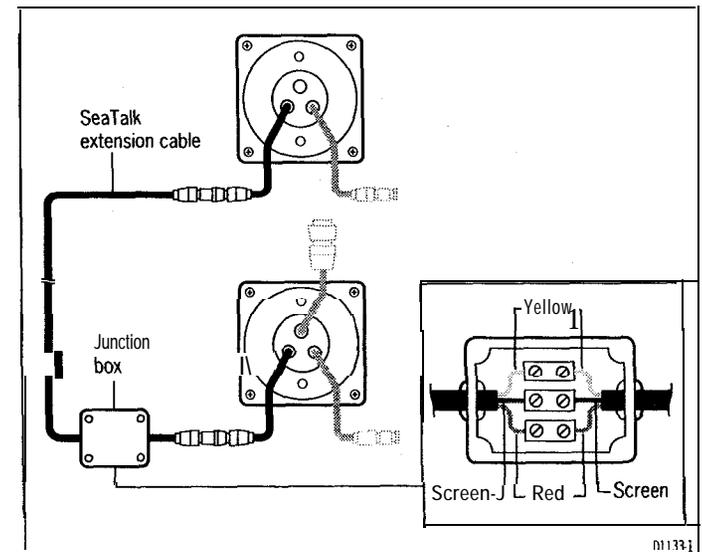


1.5 Connection of Separated Instruments

Separated instruments can be connected using one of the range of SeaTalk Extension Cable. These cables are supplied with a SeaTalk connector fitted to each end. A junction box can be used to join the cable if it is cut for easier routing or shortening.

if preferred, any 2 core, screened cable conforming the following specification may be used instead of the SeaTalk cable.

- 22 AWG, 2 core screened cable with a minimum copper area of 0.5mm².



011331

Ring Connection

Installations with a large number of instruments on a SeaTalk bus may require a second ringmain connection to the power supply breaker to prevent excessive voltage drops. Whether a second ring main is required can be determined from the following:

Cable run **upto 10m** (33ft)

Single connection: 13 instruments maximum

Second connection: 26 instruments maximum

Cable run **upto 20m** (66ft)

Single connection: 7 instruments maximum

Second connection: 13 instruments maximum

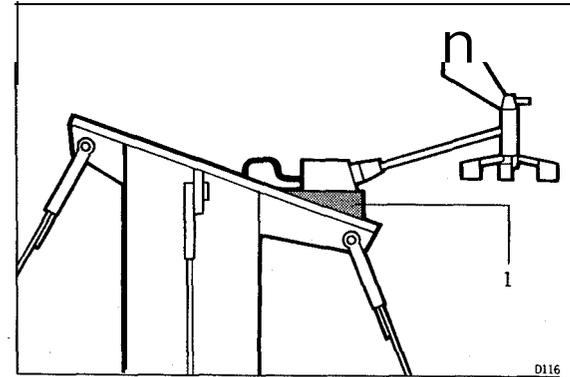
The second ring-main should be connected to the spare lead on the last instrument in the chain and directed back to the circuit breaker.

Chapter 2: Transducer Installation

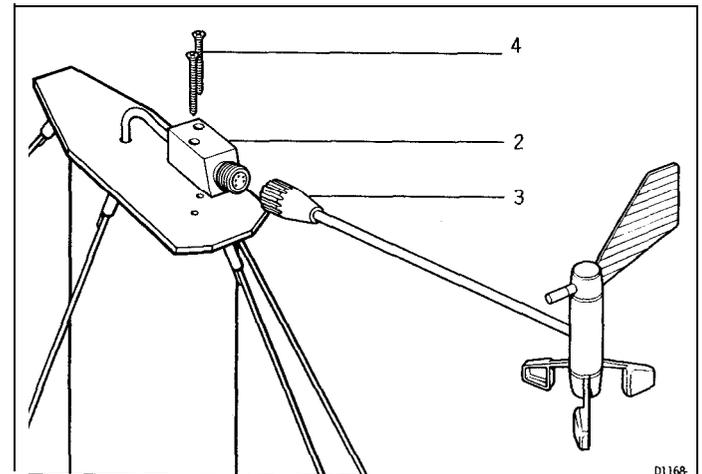
2.1 Connection to the Control Head

The ST50 Plus Wind is supplied with a transducer cable tail and connector which simply plugs into the 30m (100ft) transducer cable.

2.2 Masthead Transducer Installation



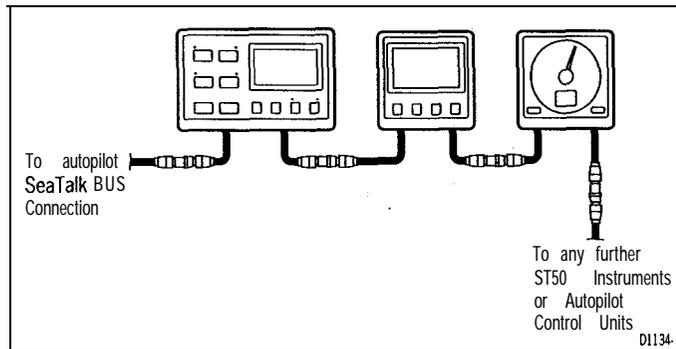
For best performance the mounting block must be fixed to a horizontal surface. If the mast top is not horizontal, make up a wedged packing piece (1).



1. With the threaded end of the mounting block (2) facing forwards, mark the position of the two self-tapping screws.

Connection to SeaTalk Compatible Autopilots

If the installation includes a SeaTalk compatible Autopilot the ST50 instruments may be connected to the SeaTalk bus at any point. No independent connection to the 12V power supply is necessary as the instruments receive power from the Autopilot course computer.



2. Drill two holes using the 4mm (5/32in) drill bit (supplied).
3. Apply sealing compound to the bottom of the mounting block (2).
4. Secure the mounting block to the mast top using the two screws (4).
5. **Tighten the locking ring (3) securely by hand.**

Cabling

1. Cut the cable so that there is sufficient length to run from the masthead transducer to the below deck junction box.
2. Feed the cable down the mast -if the mast is deck stepped the cable should be passed through the deck using a proprietary deck gland.
3. To allow for unstepping, connect the cable to the junction box close to its entry into the vessel.
4. Run the cable from the junction box back to the control head.
5. Connect the control head and masthead transducer cable tails together.

Chapter 3: Fault Finding and Maintenance

3.1 Fault Finding

All Autohelm products are, prior to packing and shipping, subjected to comprehensive test and quality assurance programmes. However, if a fault arises with the ST50 Plus Wind, the following table will help to identify the probable cause and provide the most likely cure.

Fault	Cause	Action
Instrument display blank.	No supply.	Check supply. Check cabling and security of SeaTalk connectors. Check fuse/breaker. Return unit for repair.
CL is displayed when unit is powered on.	CODELOCK security system has been activated.	Correct code number must be transmitted before unit will operate
No exchange of information between SeaTalk instruments (ie, illumination levels).	SeaTalk cabling problem.	Check security of SeaTalk connectors. Remove instruments one by one to isolate faulty unit.
Failure of a group of instruments in SeaTalk chain.	SeaTalk cabling/connector problem.	Check security of SeaTalk connectors between functioning and non-functioning instruments.

! Maintenance

Instrument

Certain atmospheric conditions may cause condensation to form on the control head window. This will not harm the instrument and can be cleared by increasing the illumination setting to Level 3.

Chemical and abrasive materials must not be used to clean the ST50 Plus Wind instrument; if it is dirty, clean with a soft, damp cloth.

Transducer

Apply silicone grease to the mounting block and transducer contacts every season.

Always remember to remove the masthead transducer when stepping or unstepping the mast.

Cabling

Examine all cables for chafing or damage to the outer shield and, where necessary, replace and resecure.

Advice

For advice, or further information regarding the installation of this product, please contact the **Autohelm** product Support Department or your own National Distributor.

Chapter 4: Operation

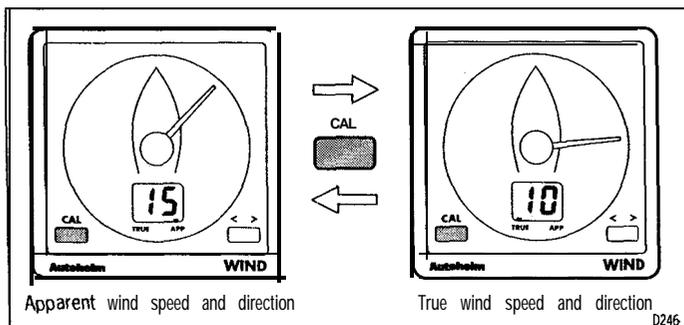
The ST50 Plus Wind can be used as a standalone unit or, when connected to other **SeaTalk** instruments, part of a fully integrated instrumentation system. This integrated system can then be linked to any of the **Autohelm SeaTalk** compatible autopilots.

When the unit is powered-up apparent wind speed and angle or true wind speed and angle will be displayed, depending on the last selection prior to the power being turned off.

If the < > key is pressed while in this mode, the **TRUE** or **APP** (apparent) legend will flash to indicate a maximum recorded reading. Also, a 1 second press and hold of this button will return the display to the current reading.

True/Apparent Wind Selection

Press **CAL** momentarily to alternate (toggle) between true or apparent wind. Once selected a solid marker appears above the selection.



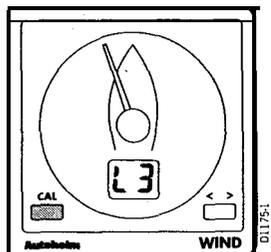
Note:

If vessel speed is not available on the SeaTalk bus when true is selected, the LCD will display a series of dashes and the pointer will continue to show the apparent wind direction.

Illumination

The ST50 Plus Wind has three levels of illumination plus off.

1. Press **CAL** for 1 second to display the current illumination level.



2. Press **CAL** within 8 seconds to select the required level: L3 High, L2 Medium, L1 Low and LO off.

Note:

The LCD display will return to normal operation 8 seconds after the last key press.

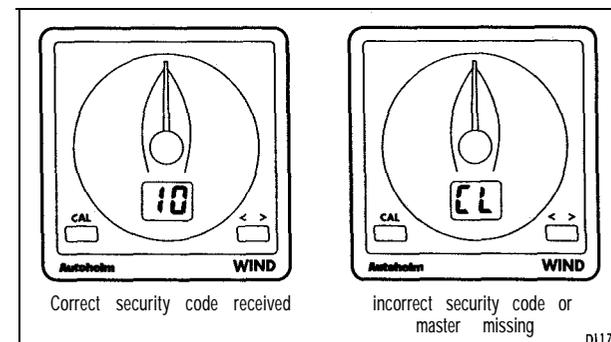
Chapter 5: CODE Lock Security

5.1 Security Code

The ST50 Plus range of instruments is equipped with a security code feature (called 'CODE Lock') to protect your system against possible theft. Entered using the keypad on digital instruments, this is a four figure number of your choice that can be entered at every power-up or, alternatively, transmitted automatically on the SeaTalk bus when there is a secure belowdecks master instrument.

The analogue ST50 Plus Wind will only respond to transmissions on the SeaTalk bus - a security code cannot be entered from this unit. Once a security code has been transmitted to this unit it will not operate until the correct code number has been received from the master instrument.

Please refer to a digital instrument handbook for complete details on the CODE Lock security system.



Chapter 6: Calibration

The ST50 Plus Wind must be calibrated before it is used for navigational purposes. Also, as it leaves the factory the instrument is set with units in knots, zero wind angle off set, and damping set at 4 seconds. These settings can be adjusted as described in the following sections.

Initial Calibration

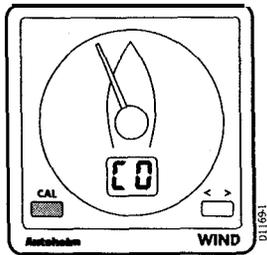
Windvane Alignment

Before the unit is used for navigational purposes the masthead transducer must be accurately aligned to the vessel. Before this procedure is carried out the windvane should be linearised as follows.

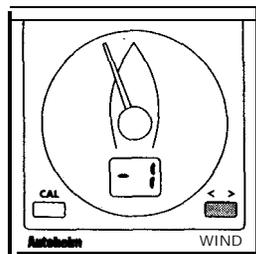
1. Power-up the ST50 Plus Wind instrument.
2. Turn the vessel through two complete circles, making sure that the windvane remains in line with the wind - the instrument will automatically linearise the windvane.

Alignment

1. Press and hold CAL for 2 seconds until CO is displayed by the LCD.



2. Press <> to move the pointer to the correct wind angle.



- Press <> once to move the pointer by 1 degree.
- Press <> for 1 second to move the pointer by 10 degrees/second.

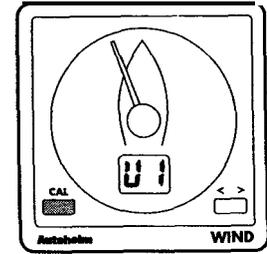
Note:

The LCD will now display the applied correction.

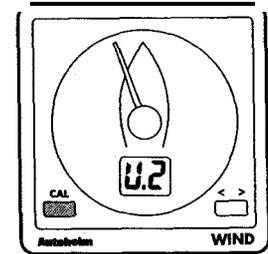
3. Press and hold CAL for 2 seconds to exit and store windvane alignment.

Windspeed Unit Selection

1. Press and hold CAL until U1 (Knots) or U2 (Metres/second) is displayed.

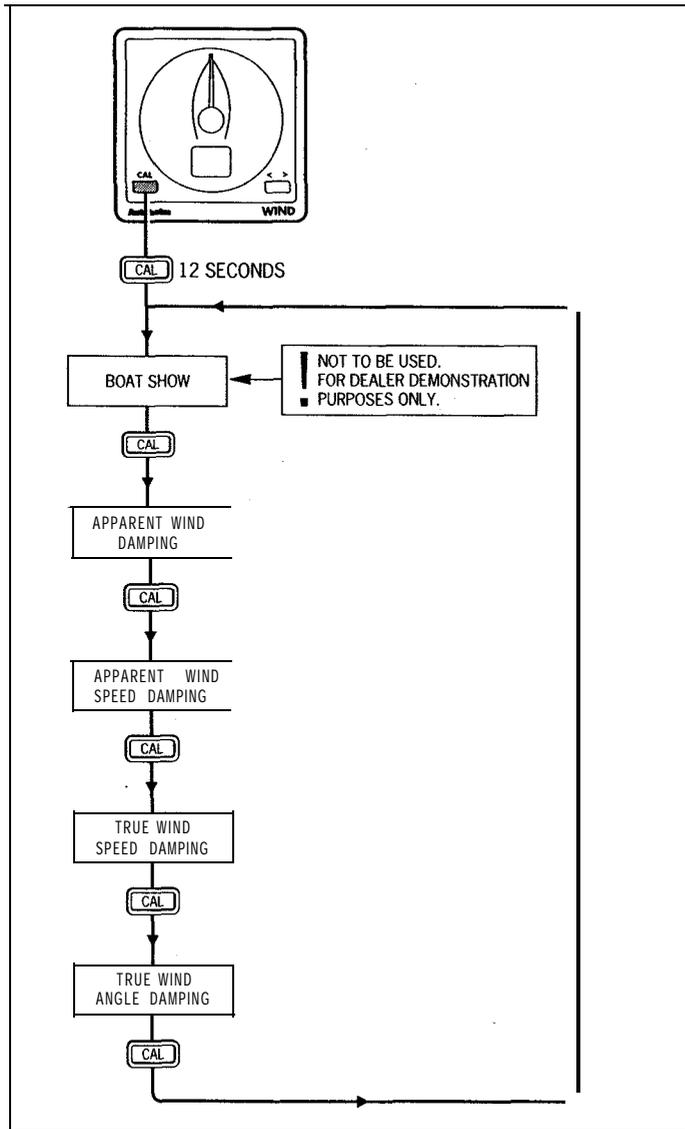


2. Press CAL within 8 seconds to change the windspeed units selection.



3. After 8 seconds the wind instrument returns to normal operation.

Extended Calibration



The options in extended calibration are changed using the <> rocker key.

Extended Calibration Notes

Boat Show Mode

Boat show mode 'S' is a dealer demonstration program only. Under no circumstances must this program be engaged when this unit is installed on your vessel. The display must, therefore, always be set to 'SO' (inactive).

Apparent Wind True Wind Angle Damping

Apparent wind angle damping is identified by an upper case 'H' and a number between 1 and 9 (seconds).

Apparent Wind Speed Damping

Apparent wind speed damping is identified by an upper case 'J' and a number between 1 and 9 (seconds).

True Wind Speed Damping

True wind speed damping is identified by a lower case 'c' and a number between 1 and 9 (seconds).

True Wind Angle Damping

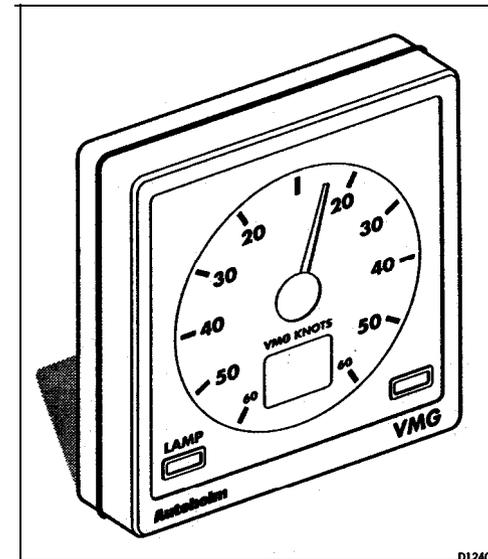
True wind angle damping is identified by a lower case 'd' and a number between 1 and 9 (seconds).

Chapter 7: General Specification

Dimensions:	110x110mm(4.33x4.33in)
Power supply:	10 to 16V
Power consumption:	70ma (normal) 100ma (illumination on)
Temperature range:	oto7odeg.c
Apparent windspeed:	0 to 99 knots or metres/sec
Apparent wind angle:	0 to 180 degrees port or starboard
calculations:	True wind angle 0 to 180 degrees port or Starboard
	True wind speed knots or metres/sec
	Maximum wind speed, apparent or true
Units:	software programmable
Damping:	1 to 15 seconds
Repeater capability:	Software programmable
Illumination:	3 levels plus off

Chapter 8: Close Hauled/VMG

The ST50 Plus Close Hauled/VMG provides an expanded close hauled display (20 to 60°) on the dial. When boat speed information is available on the SeaTalk bus the LCD provides a continuous read-out of Velocity Made Good (VMG).



8.1 Package Set

The ST50 Plus Close Hauled/VMG package comprises of the following items:

1. ST50 Plus Close Hauled/VMG control head
2. Fixing studs
3. Thumbnuts
4. Fitting template
5. Operation and installation handbook
6. Worldwide Service Centre handbook
7. Warranty document

8.2 Operation

The left hand button (lamp) is used to turn the illumination on and off, while the right hand button is a dummy without any function.

There are four illumination settings: L3 (brightest), L2, L1 and LO (off).

8.3 Installation and Maintenance

Control head installation and maintenance procedures are identical to the Wind unit. Please refer to the relevant sections in this handbook.