



MARINE INSTRUMENTS

INFORMATION MANUAL

FOR

S SERIES

SPEED & DISTANCE INDICATORS

SETS 1, 1B, 2, 3, 3D & 6

(with square plastic cases).

INTRODUCTION

MIDAS marine instruments are designed and manufactured for use in yachts and pleasure launches, they are sold with a 24 month guarantee from the date of sale.

The performance of any instrument depends on:

- (a) the selection of an instrument suitable for the intended use,
- (b) the quality of its design and manufacture and,
- (c) the standard of workmanship used in its installation.

MIDAS instruments are not difficult to install and providing some simple rules are followed during installation excellent performance will be obtained from the installed instrument.

All cables carrying power must be at least 0.5 sq mm cross section. Cables larger than this are not recommended as they are difficult to terminate on the instrument.

If long cable runs to the instruments are necessary then it is advisable to run separate power supplies to each of them, otherwise voltage drops can occur and make one instrument react with another.

No instrument can function for ever without some service, check the instrument regularly particularly at the rear where the circuitry is mounted and keep it clean. Remove the transducer regularly to clean it.

The lighting in the instruments can be dimmed by inserting a potentiometer in the 12 volt supply to Pin 7.

A sealing plug is supplied and should be fitted in place of the speed transducer when the boat is moored for a long time in water where marine growth is likely. The plug can be used to replace the transducer when it is removed to clean the paddle wheel. The paddle wheel may also be coated with a thin coat of anti-fouling paint to reduce growth.

At Pin 6 a positive 12 volt pulse is generated every 1/100 mile, this signal can be used as the input to a second distance recorder (repeater) or a satellite navigation system capable of computing a DR position.

The instrument indicates speed and distance through the water and you must allow for tide and current to obtain speed and distance over the bottom.

Having said the above we are always here to give advice, so before installing the instrument if you are in any doubt at all please ring us so that your problem can be solved before installation, rather than later when you should be sailing not fixing faults. Your retailer will have our telephone number.

SPEED TRANSDUCER

The transducer body is molded from nylon and should last for years. In its correct operational mode, it is, pushed down into the housing as far as it will go, and sited as far ahead of the keel as possible. The paddle rotates at approximately 2.5 revs per sec for each knot, i.e. 4 kts equals 10 revs per sec, 6 kts equals 15 revs per sec.

The operation and accuracy of the instrument depends completely on the fitting of the paddle wheel transducer. Whilst it is impossible to give a definite siting for all boats certain rules exist.

POSITIONING THE SPEED TRANSDUCER

YACHTS: The preferred position is where the water is diverging around the hull and is free from turbulence and eddies. This is generally in the forward one-third of the hull and is usually at least 600 mm in front of the keel and approximately 300 mm off the centerline. Generally the speed transducer can be mounted on one side of the centerline with the depth transducer in a similar position on the opposite side of the keel. If due to access considerations, it is necessary to locate the depth transducer and speed transducer on the same side, locate the transducers so that the turbulence created by one does not affect the other by ensuring they are not placed directly behind each other.

BILGE KEEL YACHTS: The transducer should be installed between the keels as far forward as possible of the leading edges.

LAUNCHES: The depth and speed transducers should be mounted aft so that they remain immersed at full speed. Both should be installed ahead of the propeller turbulence and be sufficiently under water that no surface bubbles are encountered.

Ensure that the selected position is not obstructed internally by frames or fittings. The minimum clearance height for the removal of the transducer from its housing is 100 mm.

FITTING THE TRANSDUCER

Drill a small pilot hole, enlarge the hole to 42 mm diameter. Remove the paddle unit from its housing. Install the housing (or skin fitting) in the boat with a suitable sealant under the flange with the GATE MARK FACING AFT.

The back nut should then be tightened to lock the housing in position. Avoid using excessive force as this may damage the housing.

Before installing the paddle unit some waterproof grease or petroleum jelly should be smeared on the "O" rings.

Install the paddle unit with the ARROWS POINTING FORWARD.

FITTING THE INSTRUMENT

The instrument case can be mounted by cutting a 105 mm hole in a bulkhead or console and sealing it in place with a bead of silicon rubber on the back of the front flange. The instrument may then be secured using the supplied self tapping screws or bolted if desired.

ELECTRICAL CONNECTIONS

Wire the installation in accordance with the circuit diagram. DO NOT make the final connections to the battery until all the cable connections and parts have been re-checked. CHECK with a meter that the positive is actually positive.

The connecting wires carrying power must be at least 14 x 0.2 mm, 7 x 0.3 mm or 0.5 sq mm. Cables larger than this are not recommended as they are difficult to terminate on the instrument plug. Cables smaller than this can be used for other wiring but they may not last long in the corrosive environment of a yacht or launch. The wires can be brought out of the instrument through a knockout in the back cover or by drilling a hole in the instrument case at the desired point.

The light in the meter uses a 1 watt 12 Volt bulb. The light circuit could be connected to an instrument light circuit, the navigation light circuit or the instrument power circuit.

Lightly grease all connections with a waterproof grease or petroleum jelly.

The ship's battery should be in a charged condition but it can be as low as 10 volts. A lower voltage or a battery in poor condition will result in erratic or non operation of the distance counter.

CALIBRATION

The calibration controls for the adjustment of speed, distance, and trim are mounted at the rear of the meter.

These controls provided operate independently of one another, the speed control continuously adjusts the speed indication, the distance control adjusts the distance indicated and the trim control adjusts the zero setting of trim.

These controls are preset at the factory, but for higher accuracy they have to be finally adjusted on the boat. To adjust them first sail at a constant speed over a known distance and make a note of the speed indicator reading. Work out your true speed, then sail or motor at the same speed as before (as indicated on the instrument) and adjust the speed control until the reading is correct. Rotate the speed control anti-clockwise to increase the speed shown on the meter. The formula for calculating speed is:

$$\begin{aligned} \text{speed (in knots)} &= \text{distance (in miles)} / \text{time (in hours)} \\ \text{or} &= 60 \times \text{distance (in miles)} / \text{time (in min)} \end{aligned}$$

For example if the indicator read 5 kts when sailing the measured distance and the calculated speed was 6 kts, continue sailing at the same speed and adjust the calibration control until the instrument reads 6 kts. The calibration should be checked again and readjusted if necessary until it is correct.

The distance recorder records every 1/100 of a mile travelled. It should indicate 100 counts over a known mile, if it doesn't then adjust the calibration control. Rotate the distance control anti-clockwise to increase the rate at which the indicator counts. Repeat if necessary until it is correct. The log should count at the rate of 1 count every 12 seconds at 3 kts and every 6 seconds at 6 kts.

Alternately when a distance indicator is included in a set this can be calibrated first followed by the speed indicator which can be set by timing 10 counts.

Time for	Speed	Time for	Speed
10 counts	(kts)	10 counts	(kts)
36 sec	10	1 min 12 sec	5
40 sec	9	1 min 30 sec	4
45 sec	8	2 min	3
51 sec	7	3 min	2
1 min	6	6 min	1

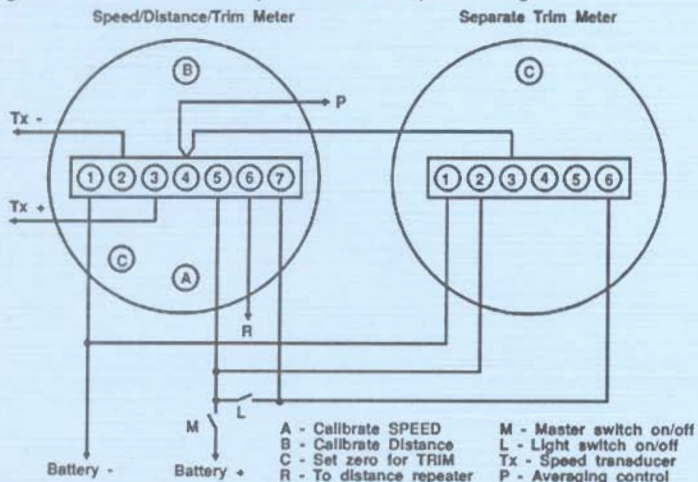
TRIM ADJUSTMENT

ANALOGUE: The trim calibration control should be adjusted with the trim instrument switched on (or trim selected on a speed/trim instrument which is also switched on) and either the transducer disconnected or the paddle wheel stopped from rotating.

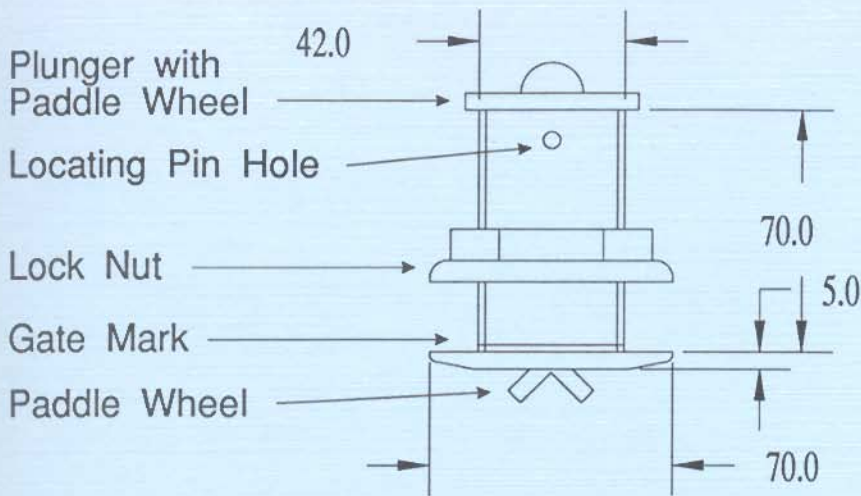
DIGITAL: The trim calibration control should be adjusted so that no display is showing when the boat is stationary or the transducer is disconnected. When the control is moved one way a + sign will show and the other way a - sign will show. The correct position of the control is midway between these points.

DIGITAL AVERAGING CONTROL ADJUSTMENT

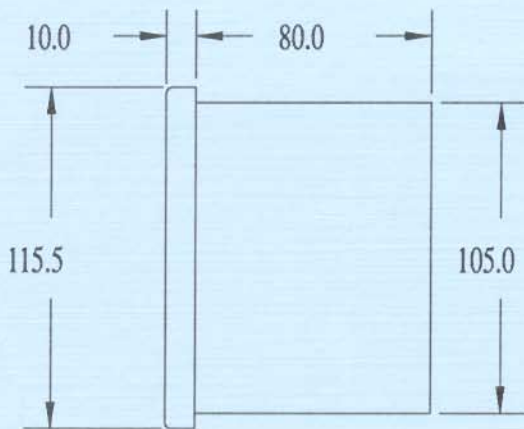
As the speed of a boat varies from the crest to the trough of waves the least significant digits of the display also change unless special precautions are taken. To reduce the rate at which the digits change an averaging circuit is built into the electronics. A front panel control is provided to change the time constant of the averaging circuit and this is set so as to produce a slow variation in the last digit. The averaging control requires adjustment depending on the sea state, a longer averaging time is required for rough water. Too long an averaging time results in a slow response to actual speed changes.



Wiring Diagram



Transducer & Hull Fitting



Meter Crosssection

Manufactured by

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