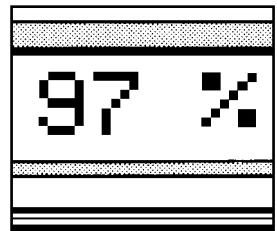
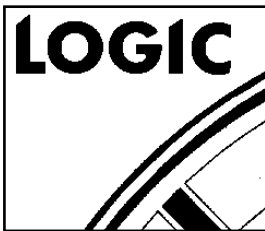
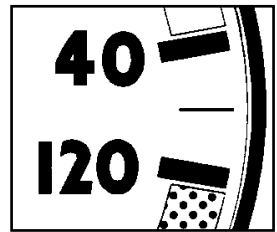
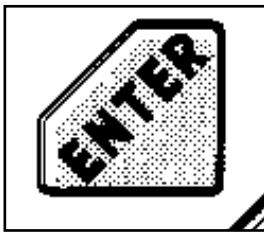
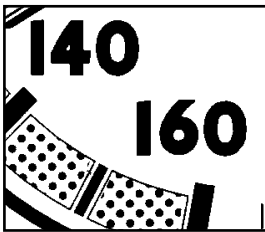
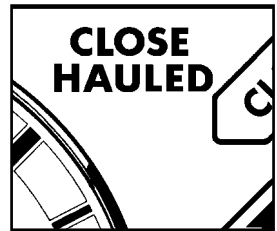
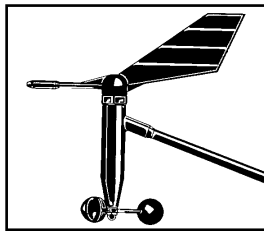
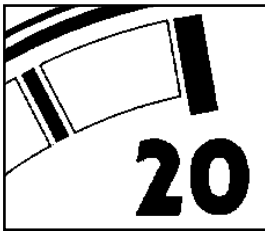


## LOGIC CLOSE HAULED

Montage- und Bedienungsanleitung  
Installation and Operating Instructions



# **LOGIC** **CLOSE HAULED**

**Installation and Operating Instructions  
Page 28 - 52**

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## VORWORT

**Dokument gehört immer an Bord!**

**Manual should always be kept on board!**

### PREFACE

With the purchase of a component from the VDO LOGIC system you selected a high-quality product, made to the accepted State of the Art. Advanced production methods and the respect of the applicable quality assurance standards guarantee that our products are shipped in excellent condition.

Thank you for your sound decision. We are certain that this system will provide you with valuable assistance and safety at sea.

You should be familiar with all functions of the system to guarantee easy and safe use of your VDO LOGIC CLOSE HAULED. Please take the time to completely study this manual.

Your VDO Kienzle agent will be pleased to help you if, thereafter, you still have questions or problems.

Yours sincerely  
VDO Kienzle Vertrieb und Service GmbH

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All rights reserved.

### SAFETY

Please respect all instructions of this manual.

All texts marked with this symbol should have your particular attention. They are indications of particular importance for the operation of the system and for your safety.



The use of the wind measuring system does not relieve you of your responsibility for your ship, which requires good seamanship. Always use your personal experience when interpreting the displayed values.

#### **Safety Instructions Concerning the Installation**

The wind monitoring system should be installed by your shipyard or by an echo sounder specialist.

Remove all metallic or electrically conducting jewellery, such as chains, bracelets, rings, etc. when working on the on-board electronics.

Disconnect the minus polarity at the battery before starting your work to prevent the risk of a short-circuit. Short-circuits can cause cable harness fires, battery explosions and damages of electronic memory systems. Please note that when you disconnect the battery, all volatile electronic memories will lose their contents, and will have to be re-programmed.

Check that there is enough room behind the installation opening. Pre-drill the opening and complete with keyhole saw (respect the safety instructions of the hand tool manufacturer).

Use insulated tools if you must work without disabling the power supply.

The electrical output of the wind indicating instrument and the cables connected to them must be protected against direct contact or damage. This means that the cables must have a sufficient insulation resistance or voltage rating, and that touching the contact points is prevented.

Electrically conducting parts of the connected loads must also be protected by adequate measures against a direct contact. The use of non-insulated wires and contacts is strictly forbidden.

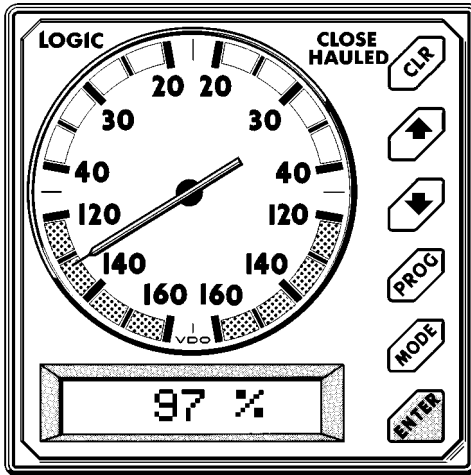
## **SAFETY**

### **Safety Instructions Concerning the Maintenance**

Repairs of the wind monitoring system components can only be made by specialists authorized by VDO Kienzle. The VDO LOGIC wind monitor system fulfills all applicable safety regulations.

Check that replacement fuses are of the indicated type and current rating. The use of temporarily repaired fuses or jumpering the fuse holder is strictly forbidden.

## VDO LOGIC CLOSE HAULED



The wind monitor VDO LOGIC CLOSE HAULED is an addition to the VDO LOGIC anemometer system, and can only be used with this system. A maximum of 3 wind monitors can be connected.

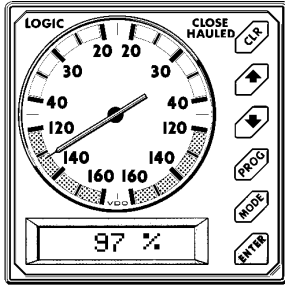
The wind monitor spreads the apparent wind direction indication, thereby assisting in steering a precise close-hauled or down-wind course. The analogue dial of the instrument spreads the important tacking angles. The spread angle zones are colour-coded to correspond to the main instrument. Other values are displayed by the LCD underneath the dial.

A complete sailing power calculation system is integrated in the instrument in addition to the apparent wind direction display, providing valuable information for the evaluation and optimisation of the sail trim. The sail performance calculation requires a LOGIC LOG in the system.

The display unit front has six large pushbuttons, to which all functions are logically coordinated for simple, uncomplicated use of the instrument.



## System components



The unit consists of:

- Display unit with protective cover
- Drilling template for indicating instrument installation
- Neoprene pad for indicating instrument
- Mounting parts kit for indicating instrument
- Connecting cable from display unit to another display unit (11 wires, length 0.4 m)
- Product certificate
- Installation and operating instructions

### Accessories (must be ordered separately)

- Connecting cable from display unit to repeatr unit (6 wires, per meter, X10.719/002/001)

## FUNCTIONS

### The functions of the VDO LOGIC CLOSE HAULED

#### Indications

- Display of apparent wind direction (indication by pointer)
- Apparent wind velocity (indication by LC display)
- Speed component down/against wind <sup>1)</sup> (indication by LC display)
- Theoretical ship speed (indication by LC display)
- Sailing performance (indication by LC display)

<sup>1)</sup> Only in combination with VDO LOGIC LOG or LOG/DEPTH

#### Settings

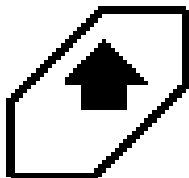
- Sensitivity selection, three degrees
- Length of ship water-line
- Sail area to ship size ratio
- Ship weight to ship size ratio

## Control keys



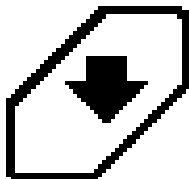
The "*CLEAR*"-key:

Use this key when programming the unit to reset values to zero. The wind alarms can be activated or deactivated.



The "*UP ARROW*"-key:

This key increases set values. A short tip will increment the value by 0.1 or 1.0. The value will continuously increase if the key is held down.



The "*DOWN ARROW*"-key:

This key decreases set values. A short tip will decrease the value by 0.1 or 1.0. The value will continuously decrease if the key is held down.



The "*PROG*"-key:

This key selects values for programming..



The "*MODE*"-key:

This key selects the values the LC display will show.



The "*ENTER*"-key:

This key terminates all programming functions and the selection of the values which will be displayed.

### Calculation of Sail Performance

The determination of the theoretical speed applies the following principle:

When the hull moves through the water, the driving power created by the sail is compensated by a resistance force of the same magnitude acting in the opposite direction.

The driving power is calculated from wind velocity, angle and the drive polar values stored in the instrument.

The water resistance acting on the hull increases with the speed of the ship; it increases with the speed. This ratio mainly depends on the hull length or the submerged part of the hull.

As the driving force equals the resistance force, the theoretical speed can be calculated if the waterline length is entered.

The rarely stable wind conditions must be taken into account. The ship cannot accelerate enough when the wind velocity suddenly increases in a gust. The time needed until both forces are equal again depends on the mass of the ship - a light ship will have quicker reactions than a heavy one. This explains the need of entering the relative ship weight to obtain reasonable values in such cases.

The ratio of the actual speed to the theoretical speed (  $V_{th}$  ) is displayed in percent (  $P(\%)$  ) in addition to the theoretically maximum possible speed. The advantage is that, independent of wind conditions, a quick trim evaluation is possible without reading the ship speed.

The correct sail performance calculation depends on several factors, such as ship waterline length, ratio of sail surface to ship size, ratio of ship weight to ship size. These ship-specific values must be set in the CLOSE HAULED (see Basic Settings).

## CALCULATION OF SAIL PERFORMANCE/BASIC SETTINGS

A realistic display of sail performance requires more influencing parameters, such as wind velocity, ship speed, wind angle. The sail performance calculation is disabled if these values are not in the system-specific tolerance range.

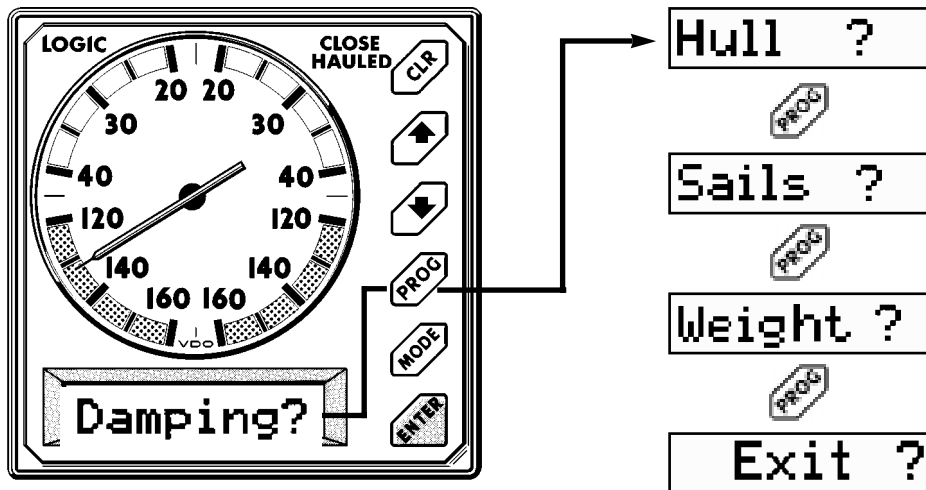
In this case the display will show four stars.

The following conditions will disable the calculation:

1. The true wind velocity is less than 4 knots
2. The apparent wind direction is less than 20°
3. The sail performance exceeds 150 % (the engine is running)
4. LOGIC LOG or LOG/DEPTH is not connected.

## The Basic Settings

The basic settings needed for a perfect operation are selected by pressing the "PROG" key.



*Damping?* Display damping adjustment

(see page 39)

*Hull ?* Entry of water-line length

(see page 40)

*Sails ?* Entry of sail area to ship size ratio

(see page 41)

*Weight ?* Entry of ship weight to ship size ratio

(see page 42)

*Exit ?* Exit programming menu

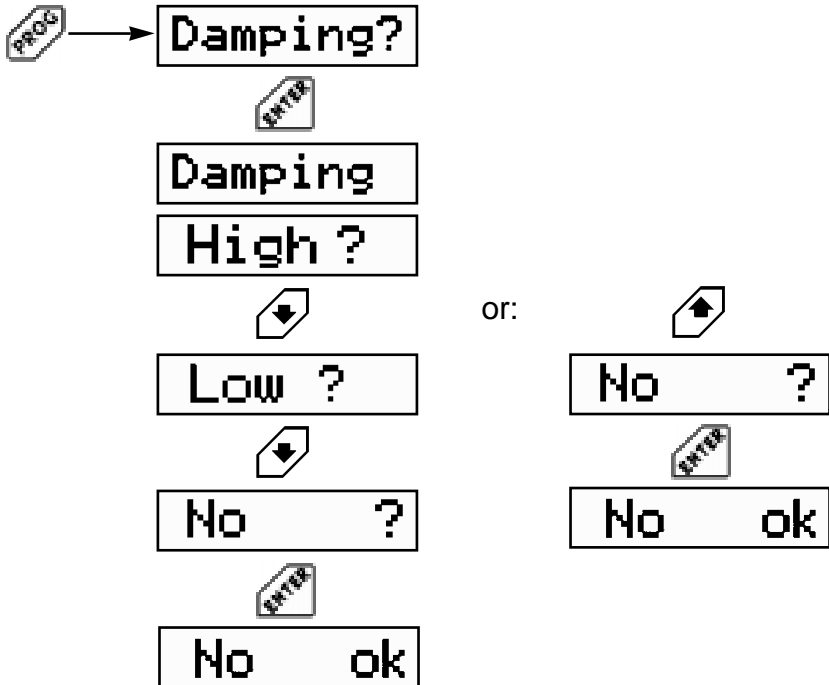
## BASIC SETTINGS

### Damping Adjustment (*Damping*)

Damping of the display influences pointer movements. Short, strong changes of the wind direction are averaged at high damping, the pointer is steadier. Low damping will directly display wind direction changes.

Damping is set as follows:

Example:



This example removes display damping. The setting can be changed at any time. The selection of damping does not affect the digital display.

## BASIC SETTINGS

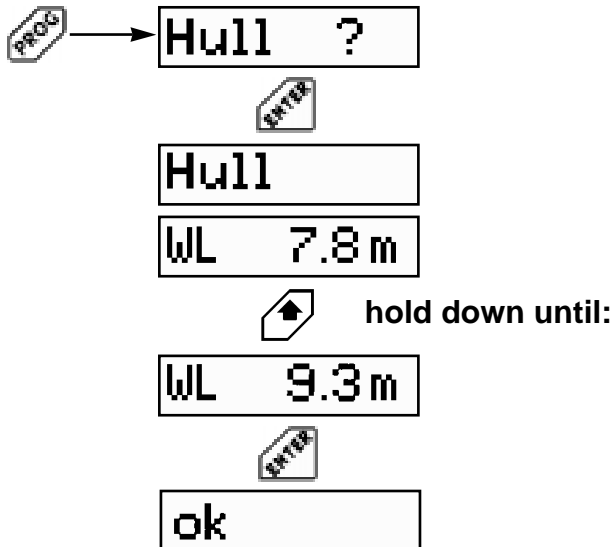
### Waterline length (Hull)

Enter the waterline length of the ship with function "Hull". This value is relevant for the sail performance calculation.

The entry range is between 5 m and 20 m. The waterline length of modern-design hulls can increase at speed. In this case select a higher value.

Enter as follows:

Example:



In this example the waterline length is changed from 7.8 m to 9.3 m.

## BASIC SETTINGS

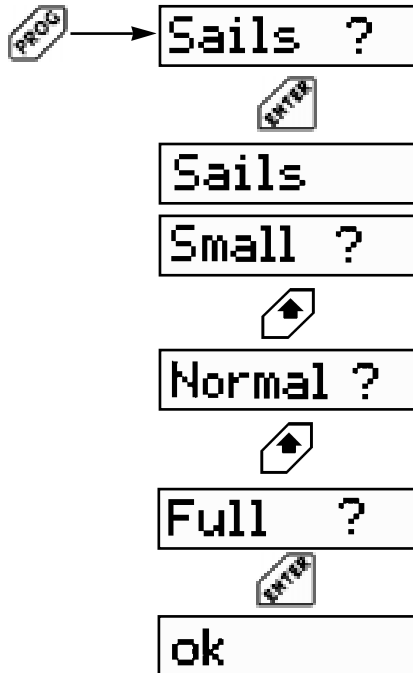
### Sail Area to Ship Size Ratio (Sails)

The selection in this function is relevant for the sail performance calculation. The following settings are possible:

Small	e.g.Engine and auxiliary sail	(small rig)
Normal	e.g.Standard ship	(normal rig)
Full	e.g.Fast yacht	(slightly rig)
Race	e.g.Racing yacht	(racing rig)

Enter the selection for your ship type as follows:

Example:



In this example "Full" has been selected; this corresponds to a fast yacht.



## BASIC SETTINGS

### Ship Weight to Ship Size Ratio (*Weight*)

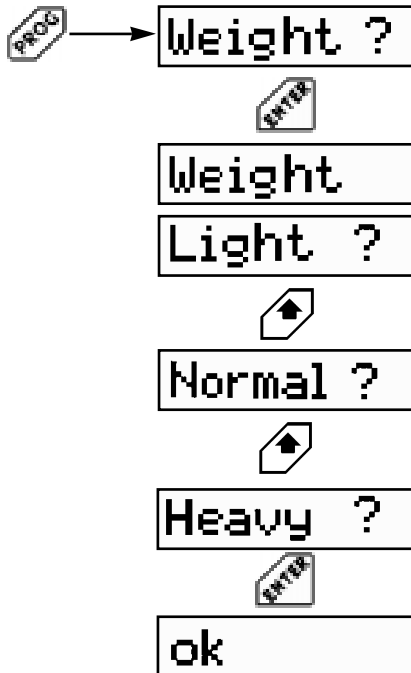
This entry is needed for the sail performance calculation; it prevents the display of unrealistic values in the case of wind fluctuations.

The following settings are possible:

Light	e.g. racing yacht
Normal	e.g. standard ship (synthetic resin hull)
Heavy	e.g. steel ship

Enter the selection as follows:

Example:

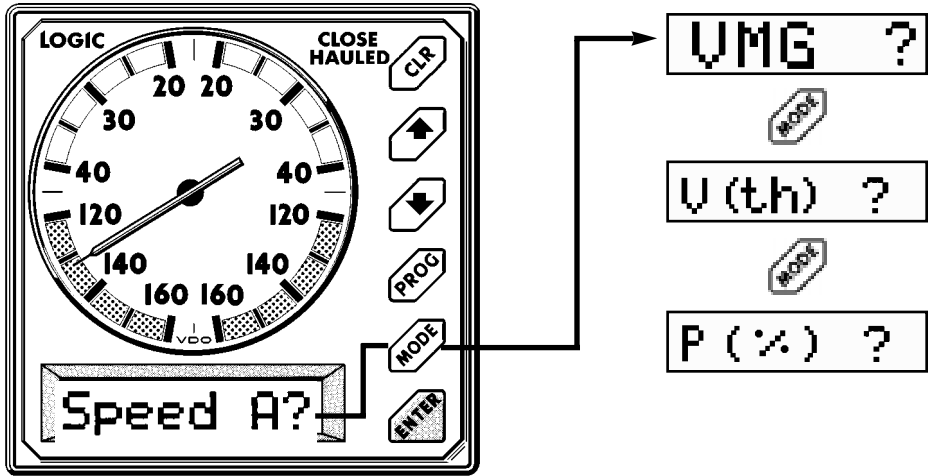


In this example "Heavy" has been selected; this corresponds to a steel ship.

## MAIN FUNCTIONS

### The Main Functions

The main functions of the VDO LOGIC CLOSE HAULED are accessed with the "MODE" key. They are selected by pressing the "MODE" key several times.



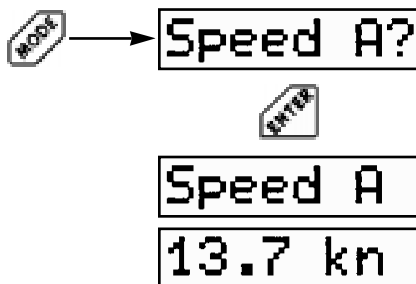
- |                 |                                   |               |
|-----------------|-----------------------------------|---------------|
| <i>Speed A?</i> | Display of apparent wind velocity | (see page 44) |
| <i>VMG ?</i>    | Display of speed against wind     | (see page 44) |
| <i>V(th) ?</i>  | Display of theoretical ship speed | (see page 45) |
| <i>P (%) ?</i>  | Display of sail performance       | (see page 46) |

## MAIN FUNCTIONS

### Display of apparent wind velocity (*Speed A*)

This function displays the apparent wind velocity. The value is obtained from the main display LOGIC WIND.

Example:

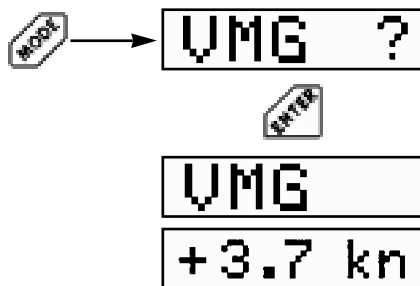


In this example the apparent wind velocity is 13.7 knots. The display unit is determined by the setting on the LOGIC WIND.

### Display of speed component against/with the wind (*VMG*)

This function displays the speed component against or with the wind. The value is obtained from the main display LOGIC WIND. The coloured dial fields mark the optimum wind angle, at which the best VMG (Velocity Made Good) value can be expected.

Example:



In this example the VMG is 3.7 kn. The display unit is determined by the setting on the LOGIC WIND. To display this unit a VDO LOGIC LOG must be installed in the system, "Missing" is displayed if this is not the case.

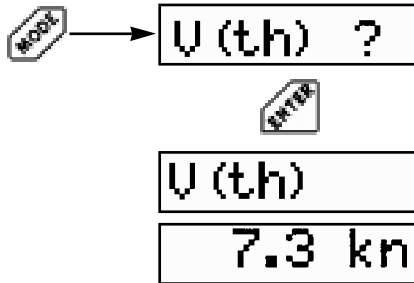
Missing

## MAIN FUNCTIONS

### Display of theoretical ship speed (*V th*)

This function displays the speed your ship type can attain under the currently existing conditions. The displayed value results from the sail performance calculation.

Example:



In this example the speed the ship can theoretically attain is 7.3 kn. To display this unit a VDO LOGIC LOG must be installed in the system. The display unit is determined by the setting on the LOGIC LOG.

"Missing" is displayed if there is no connection to a LOGIC LOG.

Missing

The following conditions will disable the sail performance calculation:

1. The true wind velocity is less than 4 knots
2. The apparent wind direction is less than 20°
3. The sail performance exceeds 150 % (the engine is running)

In these cases the function "V(th)" will display four stars.

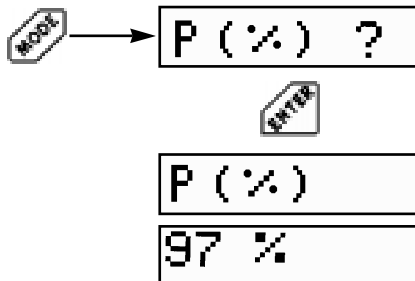
\*\*\*\*

## MAIN FUNCTIONS

### Display of sail performance (P %)

This function calculates the ratio between the theoretically possible speed and the current ship speed. The displayed value results from the sail performance calculation.

Example:



In this example the sail performance is 97 %. To display this value a VDO LOGIC LOG must be installed in the system.

"Missing" is displayed if there is no connection to a LOGIC LOG.

Missing

The following conditions will disable the sail performance calculation:

1. The true wind velocity is less than 4 knots
2. The apparent wind direction is less than 20°
3. The sail performance exceeds 150 % (the engine is running)

In these cases the function "P(%)" will display four stars.

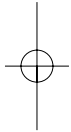
\*\*\*\*

## Error

- No function of VDO LOGIC CLOSE HAULED

- The main functions "*VMG*", "*V(th)*" and "*P(%)*" display "*Missing*"

- The main functions "*VMG*", "*V(th)*" and "*P(%)*" display four stars



## Correction

- Check electrical connections per installation plan

- Check on-board voltage, supply voltage is 10.8 to 15 V DC.

- Check contacts and connections for corrosion and dirt deposits

- Check connections of main unit WIND to LOG or LOG/DEPTH

- True wind speed is less than 4 kn

- Apparent wind angle is less than 20°

- Sail performance exceeds 150 % (engine is running)

## INSTALLATION

### Maintenance of the VDO LOGIC CLOSE HAULED

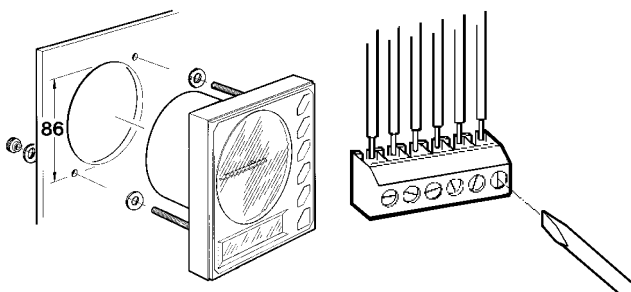
The indicating instrument is maintenance-free. Use a humid, non-napping or antistatic cloth. Do not use cleaning detergents.

### Installation of the VDO LOGIC CLOSE HAULED



Please read the safety instructions on pages 31 and 32 before starting the installation.

### Installation of the Indication Unit

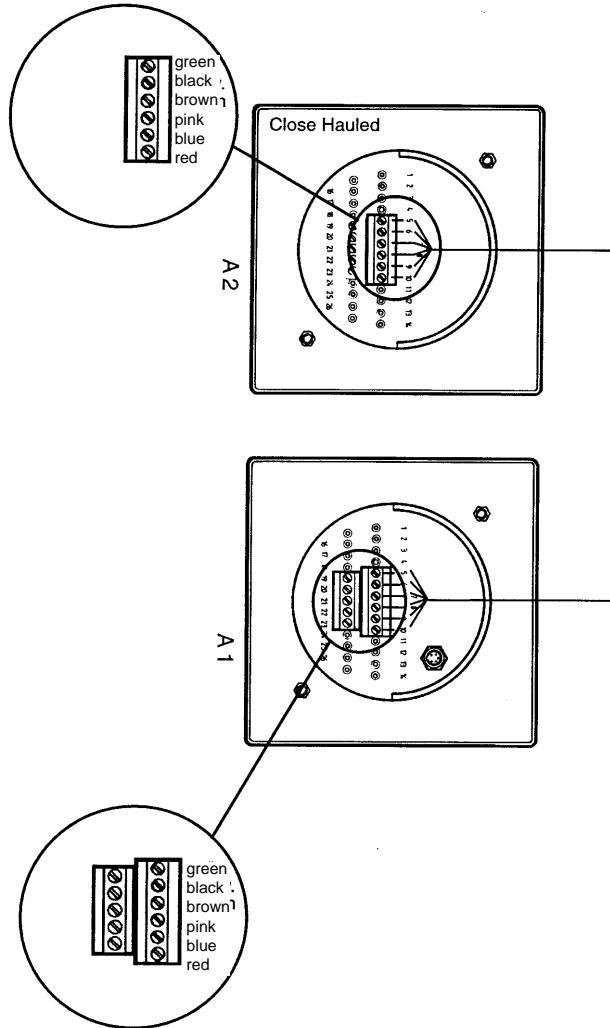


- Paste the supplied drilling template to the desired location. The drilling template has been designed for correct spacing of the instruments if other VDO instruments are also installed, and to permit the installation of the white protection cap.
- Drill the indicated holes.
- Slowly pull off the template.
- Carefully clean the surroundings before inserting the indicating instrument. Remove all chips.
- Place the supplied neoprene mat on instrument back.
- Connect the instrument per wiring diagram (see "Electrical installation"), install the threaded pins, then insert the instrument.
- Fix the instrument by tightening the knurled nuts. The knurled nuts should only be tightened hand-tight.

# INSTALLATION

## Electrical installation

### Repeater connection Close Hauled



- green = VDO LOGIC Bus 1
- black = VDO LOGIC Bus 2
- brown = GND Illumination
- pink = +12 V Illumination
- blue = GND
- red = +12 V



### Legend of Connection Diagram

1. Connection of Repeater Close Hauled
  - A1 Main Instrument
  - A2 Repeater Close Hauled

### Cable Lengths

The permissible cable lengths for use with the LOGIC bus depend on the number of indicators and of the quality of cable in question.

A standard installation with two steering positions usually comprises 12 indicators. The indicators at a steering position are linked with the cable supplied with the indicators if their arrangement permits doing so. Up to a length of 8 meters (26 feet), unshielded cable may be used to bridge the distance between two steering positions.

If a longer connecting cable is required, or if more than 12 indicators are to be connected, shielded cable will have to be used for each of the leads of the LOGIC Bus. In either case cable meeting the RG 58 standard will be a must. The shielding of the two cables will have to be connected at the main instrument side to terminal 9 of the indicator.

If shielded cable is used for connection to the LOGIC bus, the cable run between the two steering positions must not exceed a maximum length of 16 meters (52 feet).



The total number of indicators connected to the LOGIC bus must not exceed 15 in that case.

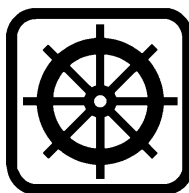
**Technical Data**

Supply voltage:	10.8 to 15 V DC
Current consumption:	about 80 mA, about 120 mA with lighting
Operating temperature:	-10 °C to +60 °C
Type of protection:	IP 65 at front per DIN 40050
EMC protection:	CE: EN 50081-1, EN 50082-1
Data input:	VDO LOGIC bus
Dimensions:	125 x 125 x 23 mm
	Installation depth 37 mm
	Installation diameter 85 mm



# LOGIC **CLOSE HAULED**

08 600 955  
Ausgabe/Edition:



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