



## Installation Instruction

# Nav Control

V1.1 08/16



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## VDO Nav Control

### Installation

This product has been developed, manufactured and tested in accordance with the requirements of EC and UL directives and the acknowledged state of the art.

Please follow all the instructions given in this handbook exactly.

### ATTENTION



Please pay attention to all text passages labeled with this symbol. These are very important hints for operating and security of the instruments.



**Before beginning work the negative Terminal of the battery should be disconnected!**

Use of information provided by the VDO system does not release you from the responsibility over your ship and demands good seamanship. Always use your nautical experience in interpreting the displayed values.

If you carry out this work yourself, wear suitable working clothes. Do not wear wide fitting clothes. If you have long hair, wear a hair-net. Clothes and hair can get caught in moving and rotating parts.

Wearing of metallic or conductive jewellery, such as necklaces, bracelets, rings etc. is not allowed when working on the electrical installation on board.

Please note that with disconnection of the battery, all volatile electronic memories lose their input values and must be reprogrammed.



## **Explosion hazard!**

Before beginning work on the engine compartment of petrol engines, switch on the ventilator of the engine compartment.

Ensure that necessary clearance is provided behind the cable opening, at the position where the gauge is to be installed.

When selecting the installation position for the gauge, take care that no stringers are drilled. Be careful also of furniture, floorboards, superstructure boxes, cables etc.

When carrying out installation work with a sealing compound, solvent vapours can be formed. Make sure of adequate ventilation and follow the instructions for use of the sealing compound manufacturer.

For the installation only use VDO approved cables.

If you don't use standard cables, the wires used should be adequately insulated or should have sufficient electrical strength, and the contact point should be protected against electrical shock hazard. The electrical conducting components of the connected consuming devices should also be protected against direct contact through suitable measures. Installation of bare metallic wires and contacts is not allowed.

Take account of the wire cross section. A reduction of the wire cross section results in a higher current density. This can cause the wire to heat up and potentially cause fire.

Connect the wires only in accordance with the wiring diagram.

## **Safety Instructions for Maintenance**

The VDO Nav Control system is maintenance-free. Do not use cleaning agents.

Repairs on the system should be carried out only by VDO authorized specialists!



## AcquaLink® Nav Control

The AcquaLink® Nav Control unit enables skippers to assume control of AcquaLink® TFTs in any situation.

Screens can be switched and menus and input variables navigated by using the push / turn knob and six other push buttons. A Nav Control unit can assume control of any display connected to the same VDO Bus with just the push of a button. Even multiple units can be connected to the same Bus without conflicts.

### In the Box

- Nav Control
- Bezel
- Template
- Installation Instruction

## VDO Bus

The VDO BUS is an NMEA 2000-based communication used within the Acqualink system to share the information gathered from the system interfaces as well as to distribute proprietary messages containing status information of the system itself. The VDO Bus uses M12 8 pin cables and all devices are powered through the network.

The Nav Box has three VDO Bus ports, so three separate VDO Bus segments can be installed. This helps to reduce the power drop in the system and allows an easy installation in all areas of the vessel.

Every 110mm gauge, 4.3" TFT and Nav Control features two equal VDO Bus connectors in the rear.

The units are daisy chained together.

**Segments have to be terminated with a VDO Terminator (included in the Nav Box box).**

**If you haven't connected an instrument or Nav Control to a Nav Box port, connect the terminator directly to the not used Nav Box VDO port.**

**If you have connected displays or gauges, use the terminator on last empty VDO port on the last unit in the chain.**



**There shouldn't be any empty connector.**

**Note:** VDO Bus cables have two female connectors. In order to extend the cable length an optional gender changer connector is needed (A2C38805500).

## VDO Bus Limitations

The Nav Box provides power to all the 110mm gauges and 4.3" TFTs connected to the system. Due to the power consumption and the resistance of the cables there are limitations of the maximum cable length and number of possible instruments in the system.

In order to have a properly working system, the voltage drop of every of the three VDO Bus segments have to be calculated.

1 LEN = 0.05 Ampere

Product	LEN
Nav Control	4
110mm gauge	4
4.3" TFT	12
52mm gauge	2

### Calculation

12V power supply:

The voltage drop for every segment of the VDO Bus is calculated as follows:

Ohm's Law:  $E$  (voltage drop) =  $I$  (circuit current) x  $R$  (wire resistance)

$R = 2/2x$  Cable Length (m) x Power Pair Resistance / 100

$L$  = Total length of VDO Bus cables in one segment

$I$  = LEN (Load Equivalency Number) x 0.050 amps

->  $E = 0.05 \times LEN \times L \times 0.057$

The voltage drop for each VDO Bus Segment shouldn't be higher than 3V.

**Note:** VDO BUS has 2x AWG 22 Power/Ground cables so there is a different voltage drop calculation than NMEA 2000.

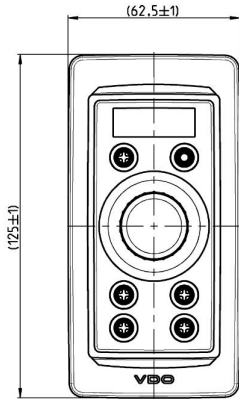
24V power supply:

If using a 24V system the voltage drop may not be higher than 9V.

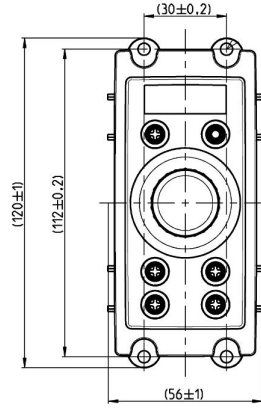
**Note:** The maximum Number of LEN in the Nav Box system is 120 equals 6 Ampere.



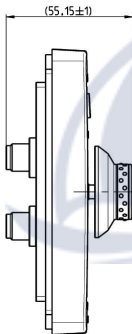
# Hardware Specification



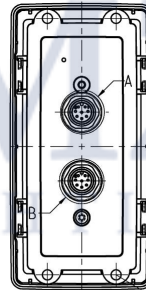
Front View (with bezel)



Front View (without Bezel)



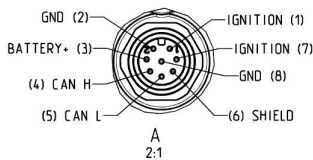
Side view



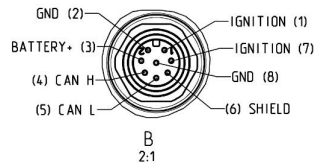
Rear view

## Pinout

X1 (VDO Bus)  
M12 Connector  
Male Code A  
IEC 61076-2-101



X2 (VDO Bus)  
M12 Connector  
Male Code A  
IEC 61076-2-101



## Specifications

Housing Material	Rear: PBT GB20
	Front: VMQ Silicone
	Knob: EN AW-AL
Bezel Material	PC-FR
Connectors	2x M12 8 Pin VDO Bus
Operating temperature	-20° / +70°
Storage temperature	-40 / +85°
Operating voltage range	8...28 VDC
Protection Class	IP 67
	According to IEC 60529:2001; in nominal position
EMC	DIN-EN 61000-6-2:2006 IEC 60945:2002
Approval	EC

## Accessory

A2C Number	Description
A2C96244600	VDO Bus Cable 0.5m
A2C96244900	VDO Bus to NMEA 2000 Adapter
A2C38805700	VDO Bus Cable 2m
A2C96245000	VDO Bus Cable 5m
A2C96245100	VDO Bus Cable 10m
A2C99793900	Termination Resistor VDO Bus
A2C38805500	Gender Changer VDO Bus





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