Bedieningshandleiding en installatie instructies

Operation manual and installation instructions

Bedienungshandbuch und Einbauanleitung

Manuel d'utilisation et instructions d'installation

Manual de manejo y instrucciones de instalación

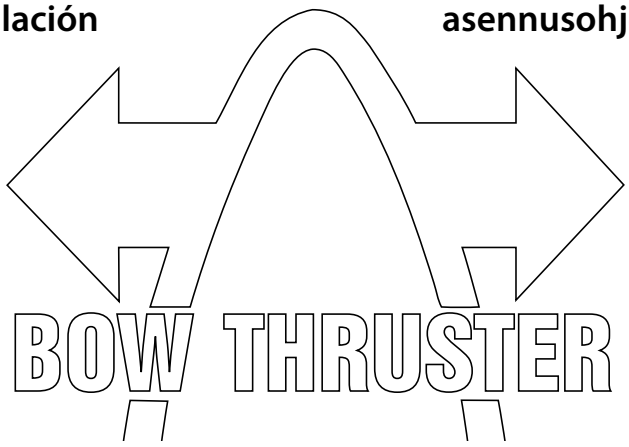
Manuale per l'uso e istruzioni per l'installazione

Betjeningsvejledning og installationsinstruktioner

Bruksanvisning och monteringsinstruktioner

Bruksanvisning og installasjonsinstrukser

Käyttö- ja asennusohje



BOW16024D

160 kgf - ø 250 mm

020528.08

Inhoud

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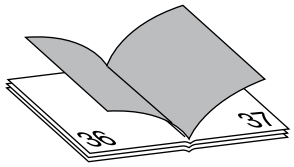


1 Introduction

These installation instructions give guidelines for fitting the Vetus bow thruster 'BOW16024D'.

The quality of installation will determine how reliably the bow thruster performs. Almost all faults can be traced back to errors or imprecision during installation. It is therefore imperative that the steps given in the installation instructions are followed in full during the installation process and checked afterwards.

Alterations made to the bow thruster by the user will void any liability on the part of the manufacturer for any damages that may result.

The thrust given by the bow thruster will vary from vessel to vessel depending on the effect of the wind, the water displacement and the shape of the underwater hull.

- The nominal thrust quoted can only be achieved under the most favourable conditions:
- During the installation process the **'Installation recommendations for bow thrusters'**, must be followed, specifically concerning:
  - Sufficiently large diameter of the battery cables so that voltage drop is reduced to a minimum.
  - The manner in which the tunnel has been connected to the hull.
  - Use of bars in the tunnel openings.

    These bars should only be used where this is strictly necessary (if sailing regularly in severely polluted water.)
  - The bars must have been fitted correctly.

Following the above recommendations will result in longer life and better performance of your bow thruster.

- Carry out the recommended maintenance regularly.
- Never allow the bow thruster to operate for a long period; the maximum length of usage is restricted because of heat release in the electric motor. After use the motor must be allowed to cool off.

NOTE

The maximum continuous length of usage and the thrust as specified in the technical details are based on the recommended battery capacities and battery cables.
If significantly larger batteries in combination with very short battery cables of significantly larger diameter than recommended are used then the thrust will increase. In such cases the maximum length of usage must be reduced in order to prevent damage to the motor.

2 Safety

WARNING!

When using the bow thruster watch out for swimmers or light boats which could be in the near vicinity of the bow thruster tunnel jet openings.

Pass on the safety instructions to others using the bow thruster.

General rules and laws with regard to safety and accident-prevention also need to be applied.

- Never touch the moving ends of the bow thruster whilst in operation.
- Never touch hot parts of the bow thruster and never place flammable materials in the vicinity of the bow thruster.
- Always stop the bow thruster before checking components or adjusting the bow thruster.
- Always detach the battery poles during maintenance work.
- Ensure maintenance work is safe by only using tools suitable for the purpose.
- Always deactivate the main switch when the bow thruster is not in use for long periods.

3 Use

- Switch on the main switch.
- Consult the handbook supplied with the control panels for instructions on using the bow thruster.

Never switch in one movement from starboard to portside or reverse, but wait until the propeller stands still, before giving it a command to operate the electric motor in the opposite direction.

CARE!

If 2 control panels are installed never operate the bow thruster from both panels simultaneously.

- Switch off the main switch when leaving the ship.

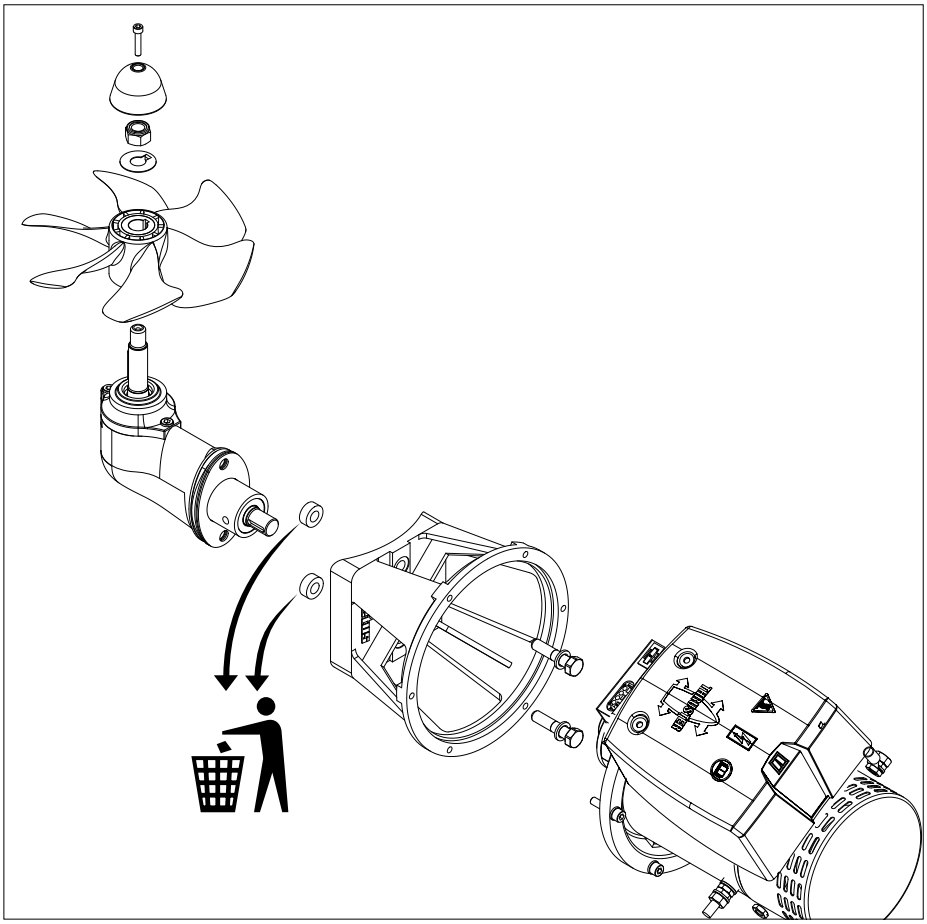
Make sure that the user of the vessel is supplied with the owner's manual.

4 Installation

In order to install the tunnel, consult 'Installation recommendations for bow thrusters', Vetus art. code 020571.03.

For overall dimensions see drawing, page 65.

> **Note**
>
> The areas in which the electric motor of the bow thruster and the battery are positioned must be dry and well ventilated.



4.1 Preparation

The bow thruster will be delivered fully assembled. Perform the following steps:

- Remove the propeller.
- Remove the motor from the intermediate flange.
- Remove the intermediate flange from the tail piece.

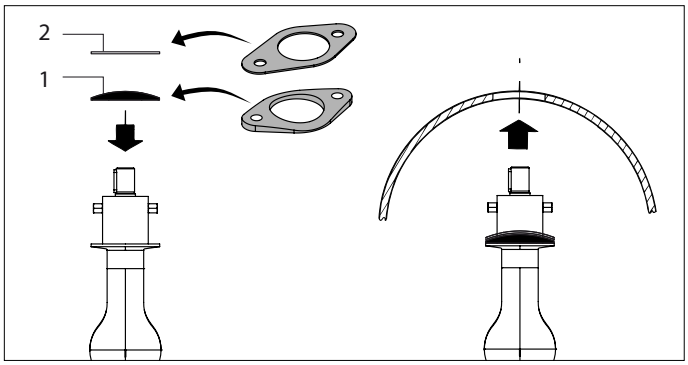
  The 2 bushes are only required for transport and are now no longer needed.

4.2 Installation tailpiece and intermediate flange

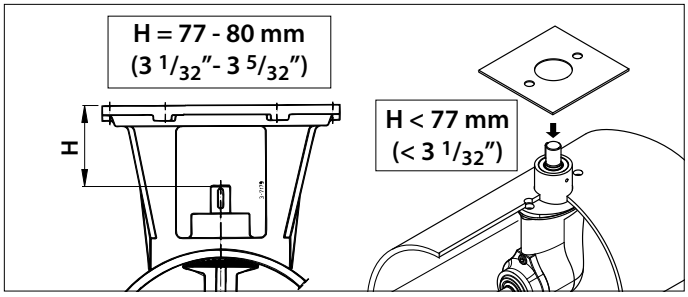
- Ensure that the plastic shim plate (1) has been positioned on the tail piece.
- Place one packing (2) between the tail piece and the tunnel.
- Apply a sealant (e.g. polyurethane or silicone) between the tail piece and packing, and between the packing and the tunnel wall.
- Place the tail piece in the hole in the tunnel.

  Any extra packings used should be ones capable of justifying the tail piece.

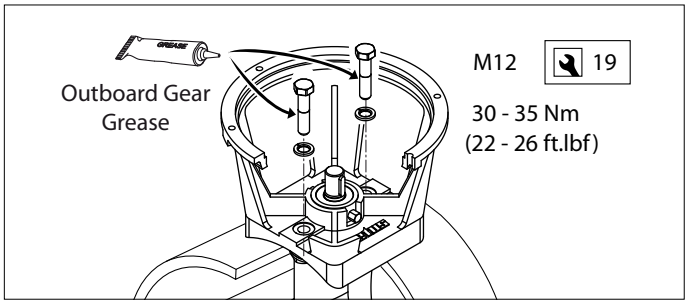
  *) e.g. Sikaflex®-292.



- Grease the hole of the intermediate flange and position this flange.
- Check dimension 'H'; it must be between 77 and 80 mm (between 3 $^{1}/_{32}$" and 3 $^{5}/_{32}$").
- If the dimension 'H' is less than 77 mm (3 $^{1}/_{32}$"), fit an additional gasket between the thrust tunnel and the intermediate flange.
- Check again dimension 'H'.



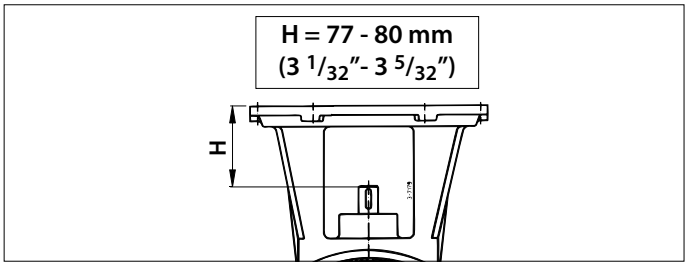
- Now fit the intermediate flange permanently to the tail piece and grease the threads of the bolts with 'outboard gear grease' before inserting and tightening them.



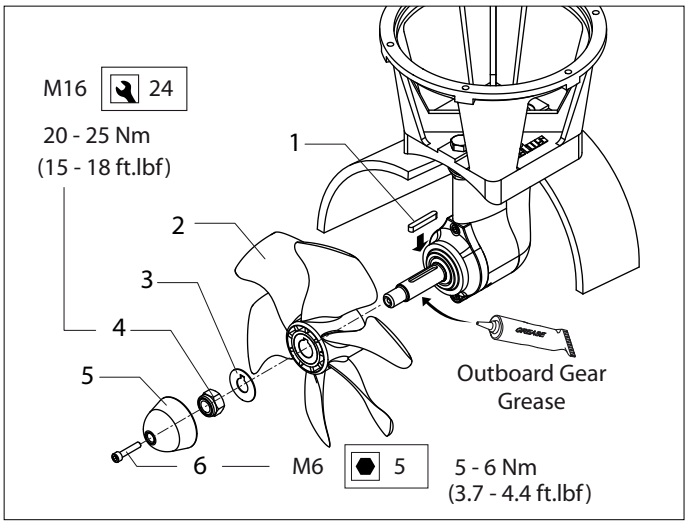
> **Note**
>
> **Check for possible leaks immediately the ship returns to water.**

4.3 Final assembly

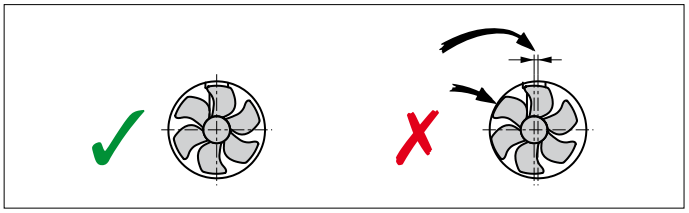
- Check again dimension 'H'.



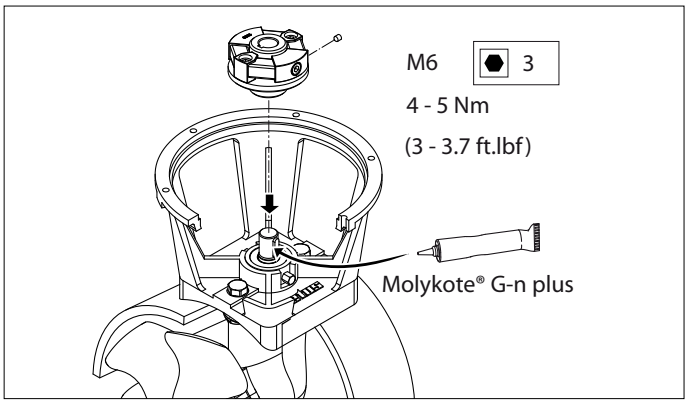
- Make sure that the key (1) is properly positioned in the keyway of the shaft.
- Grease the shaft with 'outboard gear grease' and install the propeller (2) with the lock washer (3) and the hexagonal nut (4).
- Secure the nut by bending the tag of the washer.
- Fit the zinc anode (5) to the propeller shaft by means of the bolt (6)



The propeller should run a minimum of 1.5 mm (1/16") free of the thrust tube wall, all round.



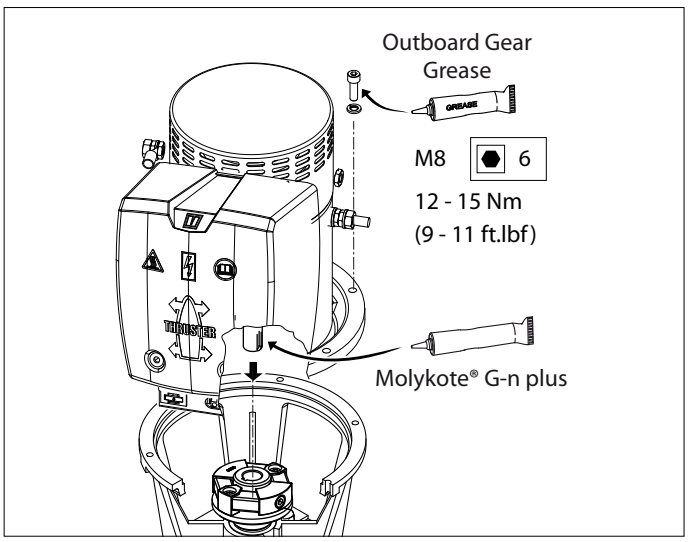
- Grease the input shaft with an installation compound, like 'Molykote® G-n plus'
- Fit the flexible coupling to the input shaft of the tail piece and secure the coupling with the locking screw.



- Grease the shaft of the electric motor with an installation compound, like 'Molykote® G-n plus'.
- Grease the threads of the fastenings bolts with 'outboard gear grease' and install the electric motor to the intermediate flange.

  Use one of these bolts to fasten the relay support as well.

- For a first check, turn the propeller by hand, it should turn easily, whilst being connected to the output spindle of the electric motor.



5 Electrical installation

Consult the chapter 'Electrical Management' in 'Installation recommendations for bow thrusters', Vetus art. code 020571.03.

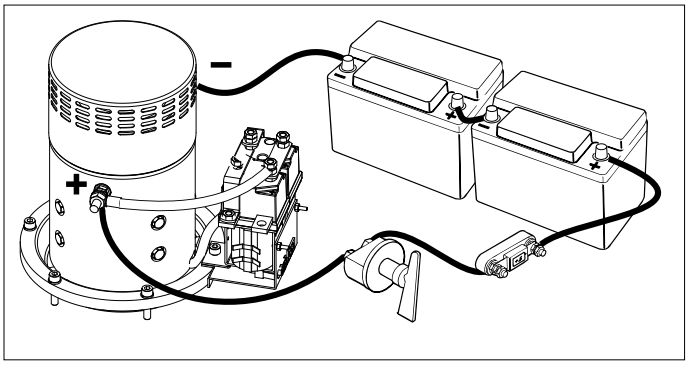
Make sure that no other electrical parts come loose when connecting the electric cables.

Check that the voltage, recorded on the motor type plate, is in agreement with the vessel's circuit voltage. Position the battery or batteries as close as possible to the bow thruster; the main power supply cables can then be short, which reduces the voltage drop as much as possible.

Check all electrical connections after 14 days. Electrical parts (such as bolts and nuts) may come loose as a result of fluctuations in temperature.

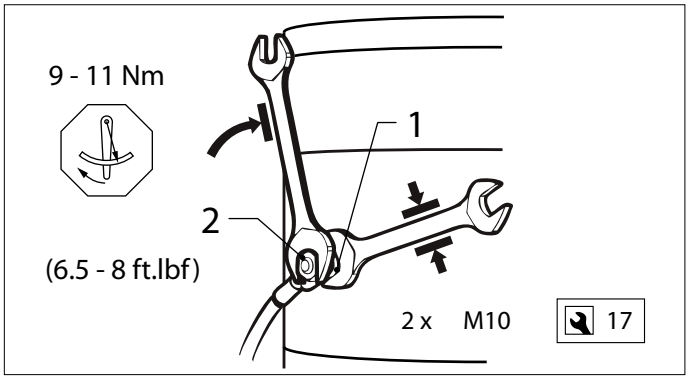
See page 69 for the applicable battery capacity, the size of main power supply cables and fuse to use.

- Connect the main power supply cables.



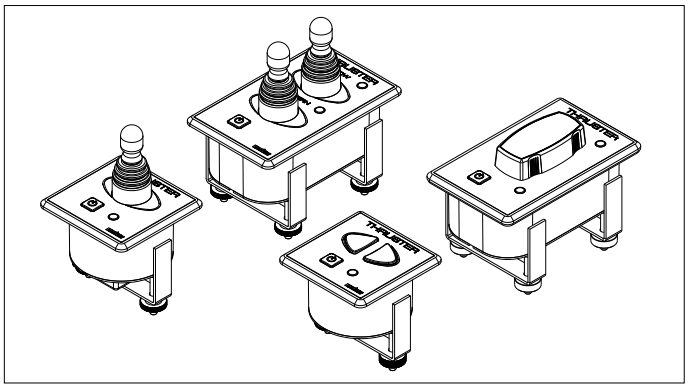
☞ **Note**

Be careful not to rotate the bolt and nut 1 while connecting the cables.
To prevent this happening, keep an open-ended spanner on nut 1 while screwing on bolt 2, without rotating this spanner.
The torque for nut 2 is 9 - 11 Nm (6.5 - 8 ft.lbf).



- Fit the control panel next to the steering position. There must be at least 50 mm (2") space behind the panel.

  If 2 bow thrusters have to be operated simultaneously, for example on a catamaran, consult the diagram on page 68.

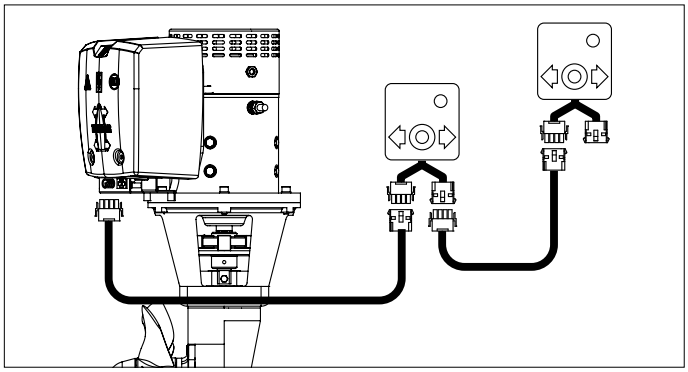


- Fit the control cable between the bow thruster and the control panel through the vessel and connect the jack connections together.

  If it is necessary to cut the intermediate cable and reconnect it take care to ensure the correct colours are connected together.

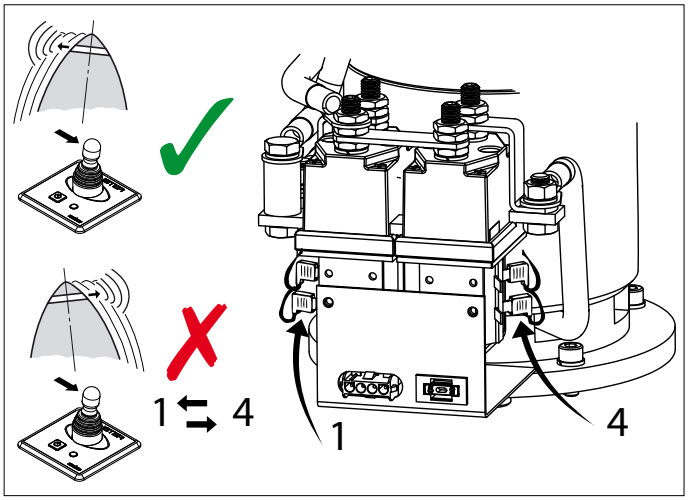
  N.B: The colours of the wire cores in the intermediate cable may differ from the wire core colours as used on the bow thruster motor and on the control panel!

  If there are two steering positions, the second control panel can be connected to the first one.



If it is found during test running that the thrust direction does not correspond with the direction switch on the control panel then the blue (no. 1) and the white (no. 4) wires on the relay must be interchanged.

> **Warning!**
> Do NOT test the bow thruster while the ship is out of water, unless you are certain that everyone is at a safe distance from the thrust tube.
> Never allow the bow thruster to run for longer than 5 seconds with the ship out of water.

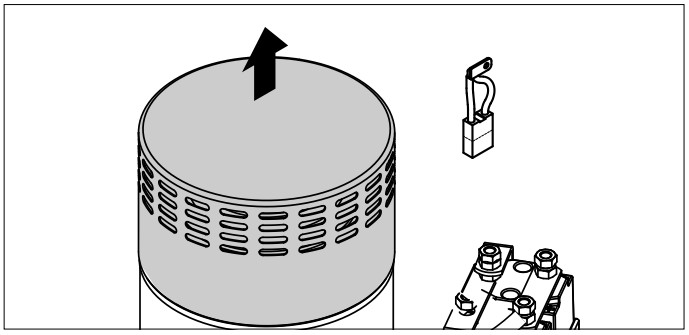


6 Maintenance

Check the carbon brushes for wear - in normal use once per year - with very intensive use of the bow thruster, e.g. with hire vessels, once every two months.

- Remove the Protective cover from the relay and then the Protective cover to the brushes.
- Clean the carbon brushes, the holders and the collector. (Blow away the dust coming off the brushes.)
- Check the length of the carbon brushes and replace before the minimum length (L min) is reached. Also check the collector for excessive wear.

  For minimum length and art. code, see page 70.
- The brushes can be taken out of the holders by releasing the retaining spring.

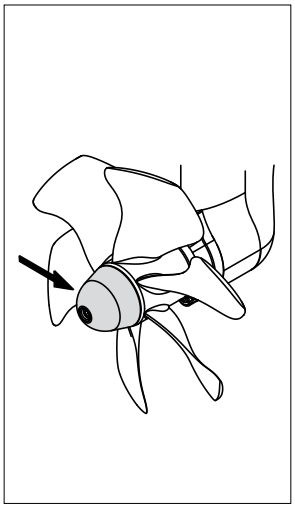


The bow thruster tailpiece has long-term lubrication.

The following maintenance should be carried out during a slipway service:

- Check the cathodic Protection and if necessary renew the zinc anode.

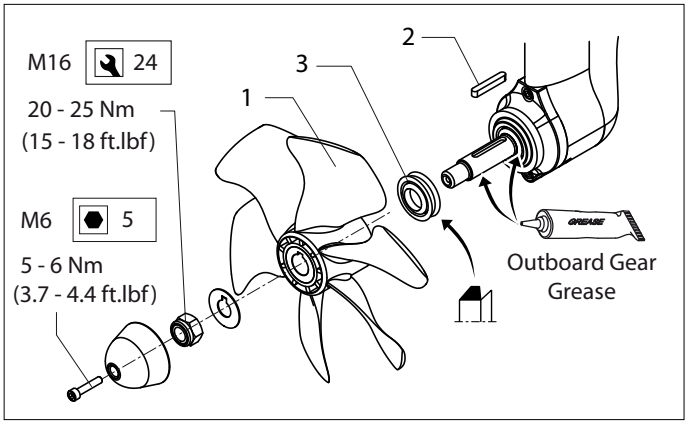
  For the art. code for the zinc anode, see page 70.



> **Warning!**
> **Check when cleaning the hull below the waterline if the detergent contains hydrochloric acid. NEVER clean the propeller with a detergent containing hydrochloric acid. Remove the propeller before applying a detergent which contains hydrochloric acid.**
>
> *Due to a strong chemical reaction of the hydrochloric acid with the bronze of the hub the plastic part of the propeller will be cracked.*

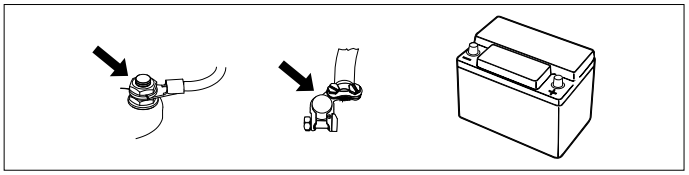
- In turn remove the propeller (1), the key (2) and the V-ring (3).
- Clean the propeller shaft and grease the running surface of the V-ring with 'outboard gear grease'.
- Fit a new V-ring.

  For the art. code for the V-ring, see page 70
- Put the key back in the shaft and refit the propeller.



Six weeks after installation and at least once annually thereafter, be sure to check all of the electrical connections between the battery/batteries and the bow thruster, as well as the connections on the motor relays.
If they have been loosened previously, prevent the nut and bolt from turning while connecting the main power supply cables. This is also why you should always use a second wrench when tightening bolts.

The instructions of the manufacturer should be followed for the maintenance of the batteries. Vetus batteries are maintenance free.



7 Trouble shooting

Electric motor does not operate

- Check that the battery main switch is 'ON'.
- Check whether the control panel fuse has burnt out. [1]
- Check if the main fuse has burnt out. [2]

In all the above cases, the 'POWER' indicator LED is not lit.

- The electric motor has overheated and its thermal Protection has broken the circuit of the control current.

  The panel gives a warning signal three times (. - . . -) and the LED will glow red.

  As soon as the motor has cooled down enough, the LED will resume glowing green and the bow thruster can be put back in service.

Check if it is possible to turn the propeller. A piece of wood or similar could have been caught between the propeller and the tunnel.

Electric motor turns slowly

- The battery is flat.
- Bad electrical connection(s) due to e.g. corrosion.
- The carbon brushes are not making proper contact.
- The battery capacity is reduced because of very low temperatures.
- Weed or fishing line has become caught in the propeller.

Control panel fuse is burnt out [1]

- Short circuit in the operating circuit; check the wiring.

Electric motor turns (too) fast but there is no thrust

- The blades of the propeller have been damaged by a foreign object having entered the propeller or tunnel.

After pressing the on/off switch on the panel, the panel is not switched on.

- The on/off switch must be pressed a **second** time within 6 seconds.

  The LED will then remain green and the buzzer will confirm that the panel is ready for use by giving the signal (- . -).

[1] The control current fuse is in the bow thruster motor. A spare fuse can be found in the relay cap, see p. 70.

[2] See table on page 69

8 Technical data

Type	:	**BOW16024D**
Electric motor		
Type	:	reversible DC motor
Voltage	:	24 V DC
Current	:	560 A [3]
Rated output	:	7 kW
No. of revolutions	:	3250 rpm
Rating	:	S2 - 4.5 min. [3]
Protection	:	IP10
Motors conform to CE (80/336/EEC, EMC - EN60945)		
Transmission		
Gears	:	Bevel gear helical teeth
Gear ratio	:	1.92 : 1
Lubrication	:	oilbath, approx. 0.1 litre (3.4 fl.oz.) outboard gear oil SAE80W or EP 90
Housing	:	bronze
Propeller		
Diameter	:	246 mm (9 11/16")
No. of blades	:	6
Profile	:	asymmetrical
Material	:	polyacetal (Delrin ®)
Rated thrust	:	1600 N (160 kgf, 360 lbf)
Control circuit		
Fuse	:	Blade type fuse 'ATO' 5 A
Current solenoid switch	:	1.4 A
Control circuit wires	:	1.5 mm^2 (14 AWG)
Extension cable	:	6, 10, 16, 18 or 20 m (20', 33', 52', 59', or 65')
Thrust-tunnel		
Steel model		
dimensions	:	O.D. 267 mm, wall thickness 7,1 mm
treatment	:	blasted, coated with: SikaCor Steel Protect. Suitable for all kinds of protection systems.
Plastic model		
dimensions	:	O.D. 265 mm, wall thickness 7 mm
material	:	glass fibre reinforced polyester
Aluminium model		
dimensions	:	O.D. 264 mm, wall thickness 7 mm
material	:	aluminium, 6061 or 6062 (AlMg1SiCu)
Weight		
Excl. thrust-tunnel	:	48.5 kg (107 lbs)

Length of usage:

[3] 4,5 min. continuously or max. 4.5 min. per hour at 560 A (24 Volt).

9 Hoofdafmetingen

Principal dimensions

Hauptabmessungen

Dimensions principales

Dimensiones principales

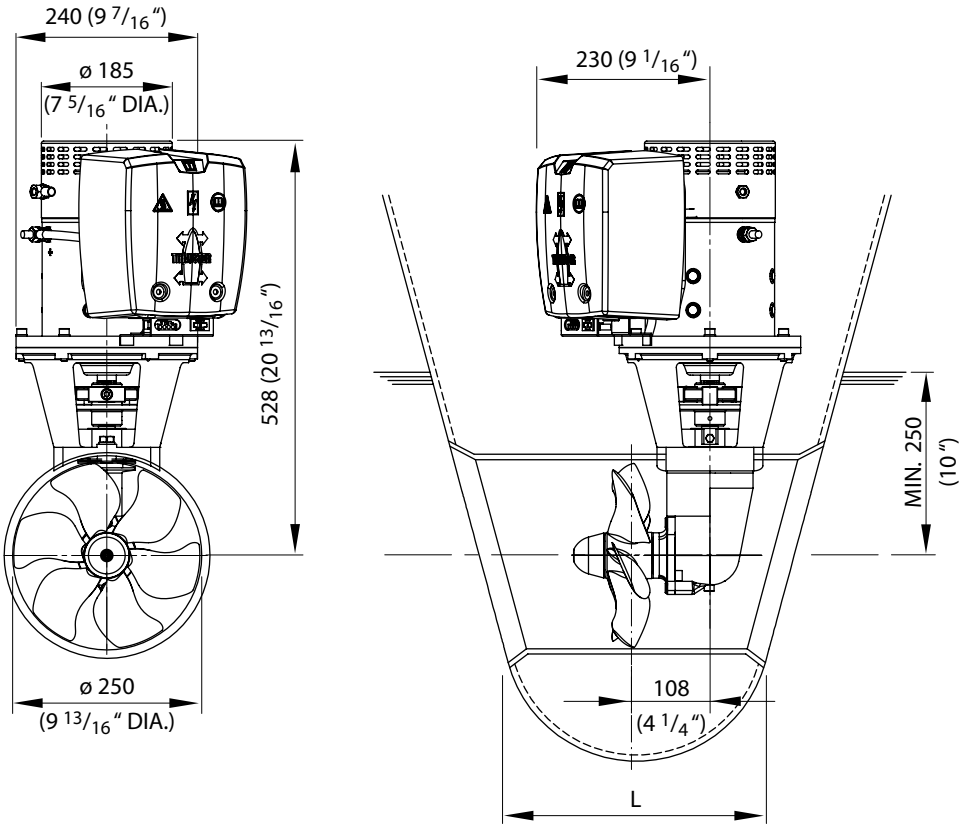
Dimensioni principali

Mål

Huvudmått

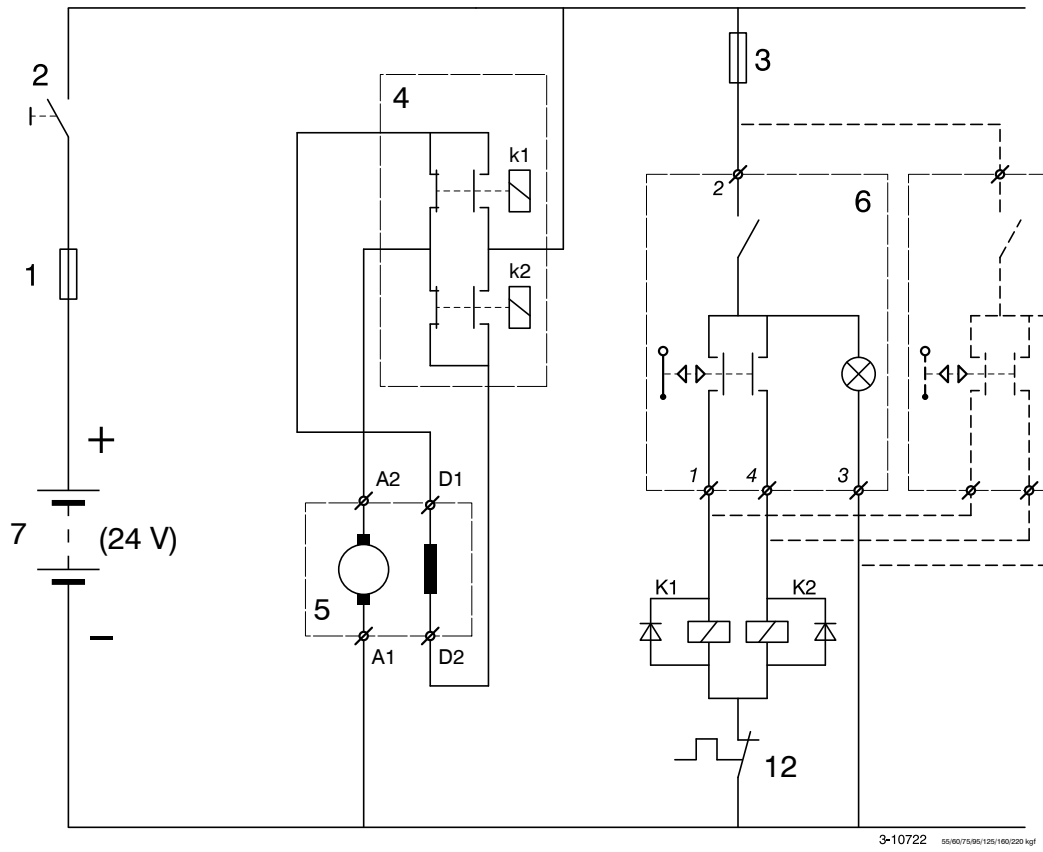
Viktigste mål

Päämitat



1 : 10

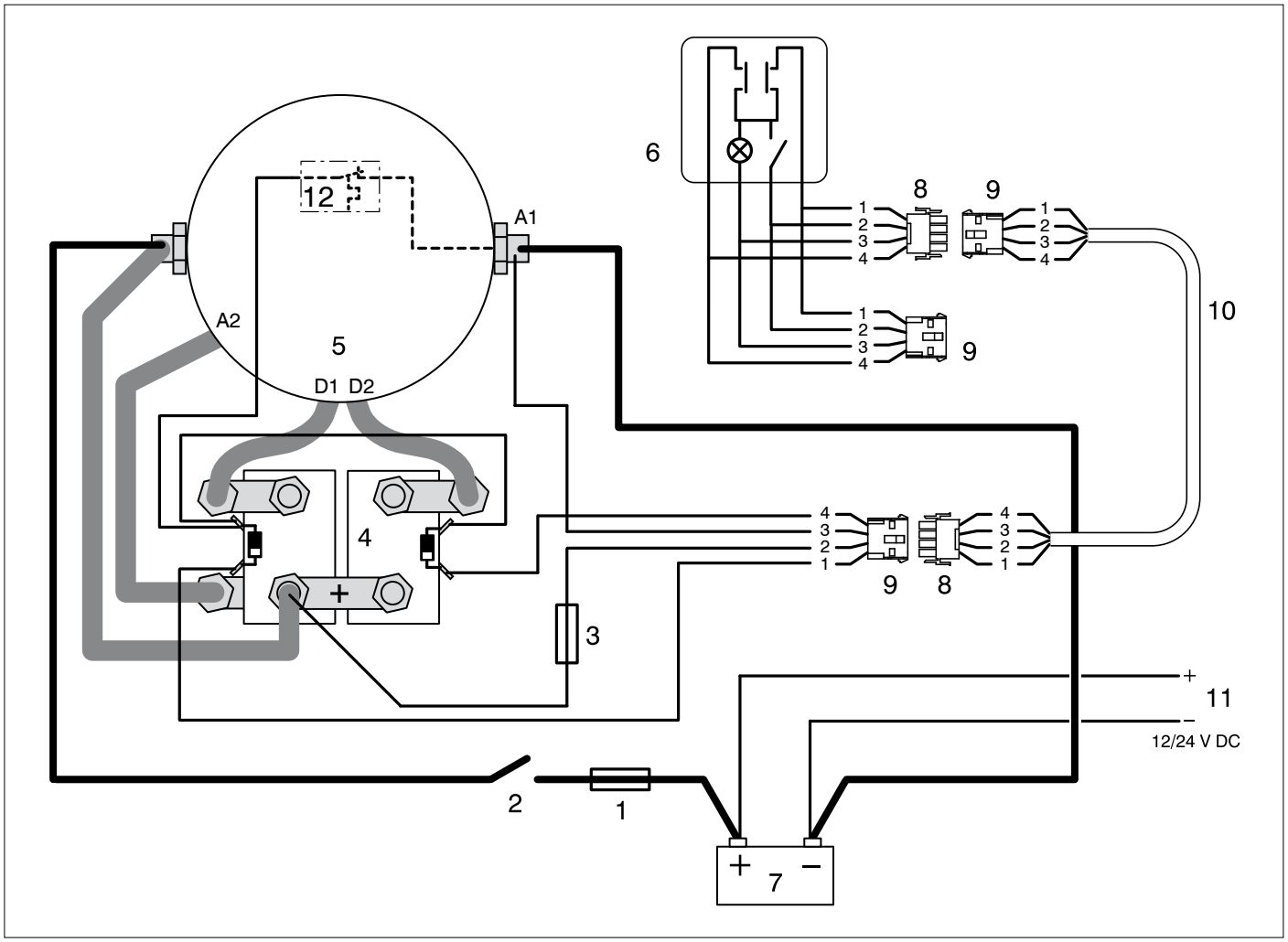
10 Elektrisch schema Schaltschema Esquema eléctrico Wiring diagram Circuit electrique



1	Hoofdzekering	Main fuse	Hauptsicherung	Fusible principal	Fusible principal
2	Hoofdschakelaar	Main switch	Hauptschalter	Interrupteur principal	Interruptor principal
3	Stuurstroomzekering	Control current fuse	Steuerstromsicherung	Fusible courant de commande	Fusible de circuito de control
4	Magneetschakelaar	Solenoid switch	Relais	Contacteur solénoïde	Interruptor de solenoide
5	Elektromotor	Electromotor	Elektromotor	Moteur électrique	Electromotor
6	Bedieningspaneel	Control panel	Bedienungspaneel	Panneau de commande	Tablero de mandos
7	Accu	Battery	Batterie	Batterie	Batería
8	Steker	Plug	Stecker	Prise mâle	Clavija macho
9	Contrasteker	Socket	Kontrastecker	Prise femelle	Clavija hembra
10	Verlengkabel	Extension cable	Zwischenkabel	Câble de branchement	Cable prolongador
11	Dynamo	Alternator	Lichtmaschine	Générateur	Generador
12	Thermische beveiliging	Thermal Protection	Thermosicherung	Sécurité thermique	Dispositivo térmico de seguridad

	Kleurcode bedrading:	Wiring colour code:	Farbkode für die Bedrahtung:	Code de couleur des câbles:	Código de color de los cables:
1	Blauw	Blue	Blau	Bleu	Azul
2	Rood (+)	Red (+)	Rot (+)	Rouge (+)	Rojo (+)
3	Zwart (-)	Black (-)	Schwarz (-)	Noir (-)	Negro (-)
4	Wit	White	Weiß	Blanc	Blanco

Schema elettrico Kopplingsschema Sähkökaavio
Elektrisk skema Elektrisk skjema



1	Fusibile principale	Hovedsikring	Huvudsäkring	Hovedsikring	Päävirtasulake
2	Interruttore principale	Hovedafbryder	Huvudströmbrytare	Hovedbryter	Päävirtakytkin
3	Fusibile del circuito di comando	Styrestrømssikring	Styrströmsäkring	Styrestrømsikring	Ohjausvirtasulake
4	Interruttore solenoidale	Magnetafbryder	Kontaktor	Magnetbryter	Rele
5	Motore elettrico	Elektromotor	Elmotor	Elektromotor	Sähkömoottori
6	Panelo di comando	Betjeningspanel	Manöverpanel	Kontrollpanel	Ohjauspaneli
7	Batteria	Batteri	Batteri	Batteri	Akku
8	Spina maschio	Stik	Stickkontakt	Støpsel	Pikaliitin
9	Spina femmina	Kontrastik	Kontrastickkontakt	Stikkontakt	Pikaliitin
10	Prolunga	Forlængerledning	Förlängningskabel	Skjøtekabel	Jatkokaapeli
11	Dinamo	Dynamo	Generator	Dynamo	Generaattori
12	Protezione termica	Termisk beskyttelse	Termiskt skydd	Termisk sikring	Lämpösuojain

	Codice colori cavi:	Farvekode til kabler:	Färgkod kablage:	Fargekode ledninger:	Kaapeleiden värikoodit:
1	Blu	Blå	Blå	Blå	Sininen
2	Rosso (+)	Rød (+)	Röd (+)	Rød (+)	Punainen (+)
3	Nero (-)	Sort (-)	Svart (-)	Svart (-)	Musta (-)
4	Bianco	Hvid	Vit	Hvit	Valkoinen

10.1 Gelijktijdige bediening van 2 boegschroeven met 1 paneel

Simultaneous operation of two bow thrusters with one panel

Gleichzeitige Bedienung von zwei Bugschrauben mit einem Armaturenbrett

Commande simultanée de 2 hélices d'étrave avec 1 panneau

Manejo simultáneo de 2 tornillos de retención con 1 panel

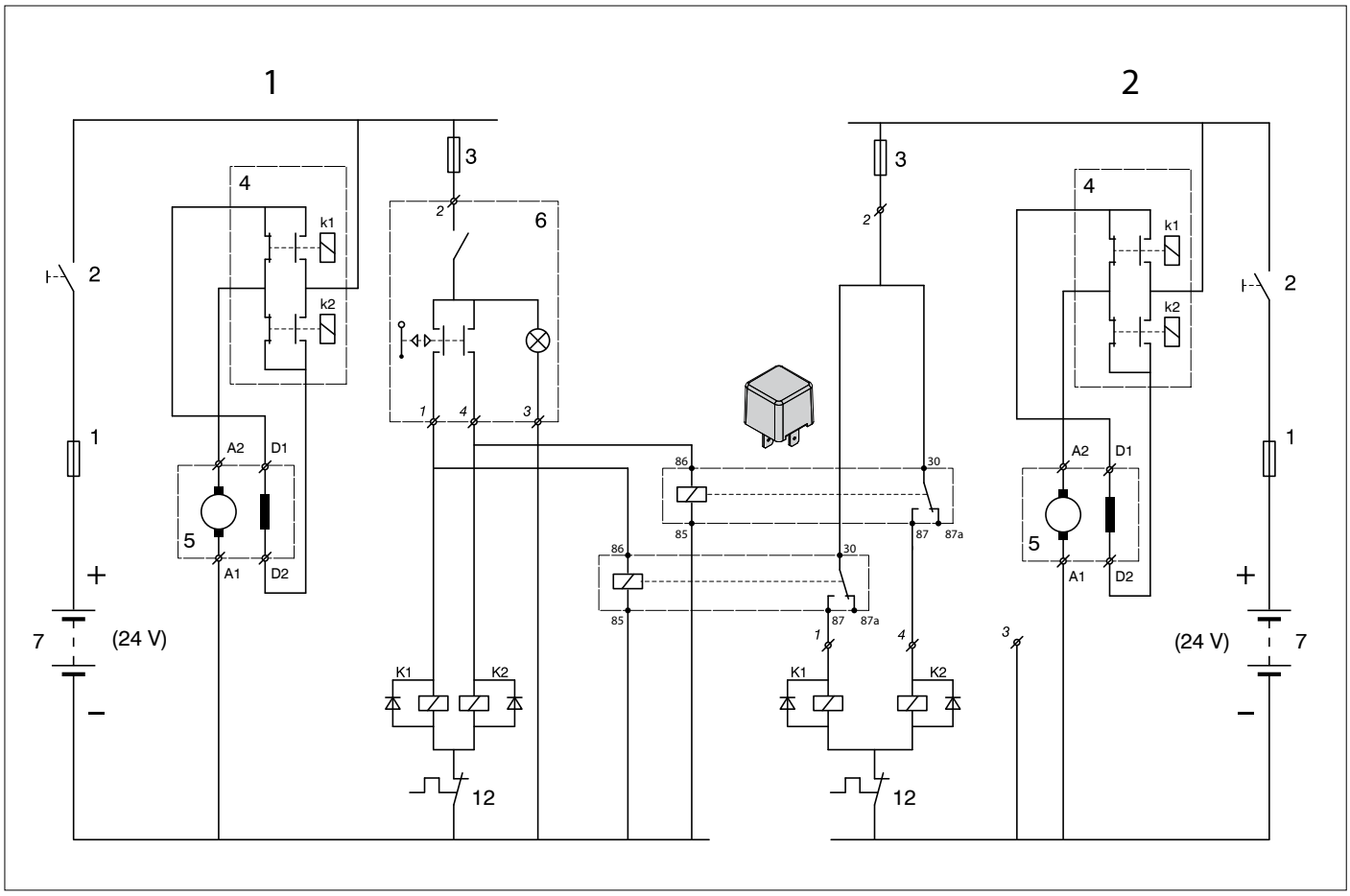
Comando contemporaneo di 2 eliche di prua mediante 1 solo pannello

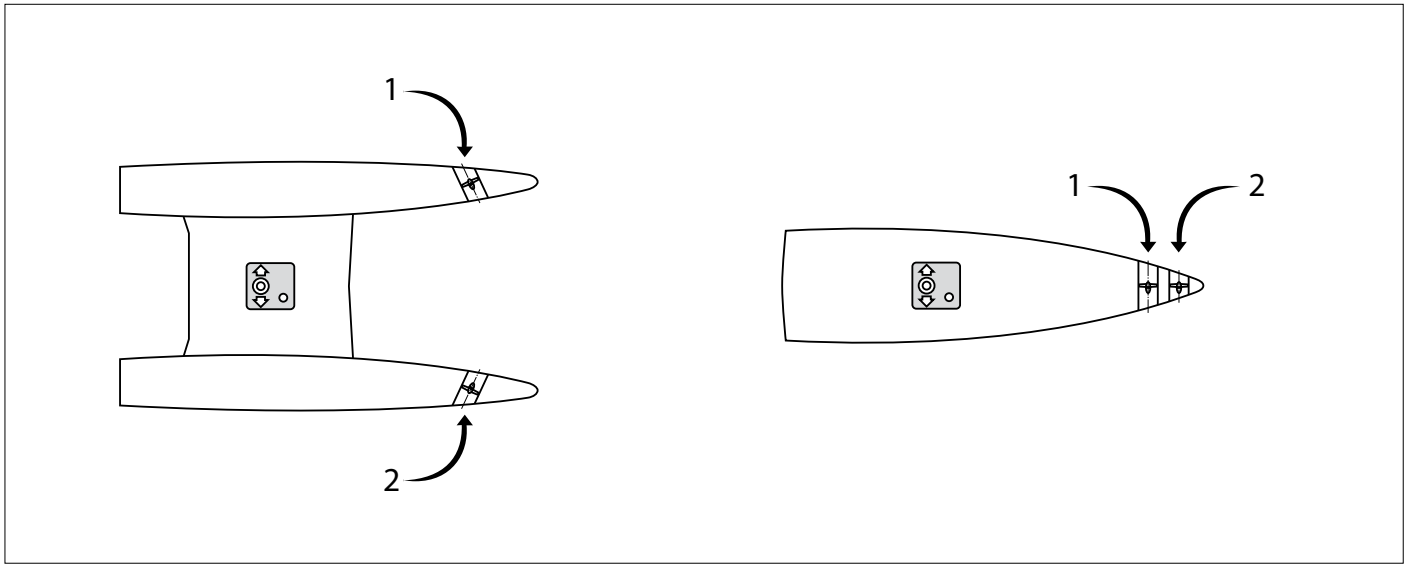
Samtidig betjening af 2 bovpropeller med 1 betjeningspanel

Samtidig manövrering av 2 bogpropellrar med 1 panel

Samtidig betjening av 2 baugpropeller med 1 panel

Kahden keukapotkurin ohjaus samanaikaisesti yhdellä panelilla.





11 Accucapaciteit, accukabels

Battery capacity, battery cables

Akkukapazität, Akkukabel

Capacité de la batterie, câbles de batterie

Capacidad de las baterías, cables de baterías

Capacità della batteria e cavi della batteria

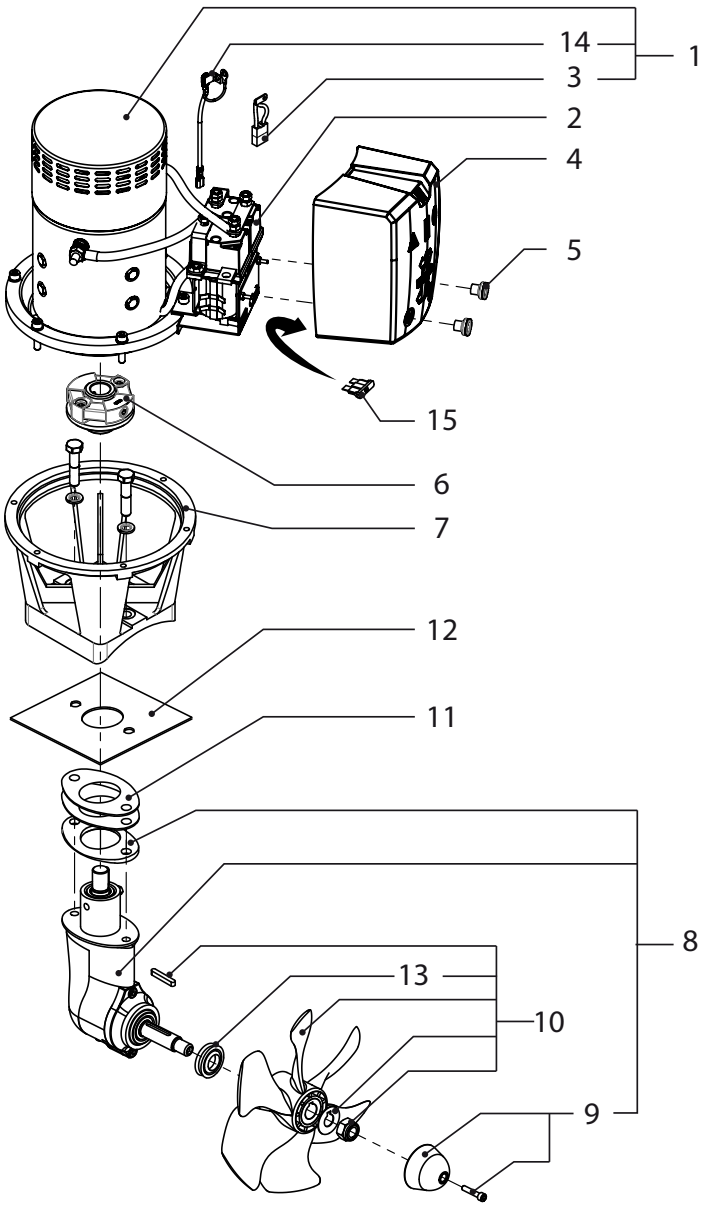
Batteriets kapacitet, batterikabler

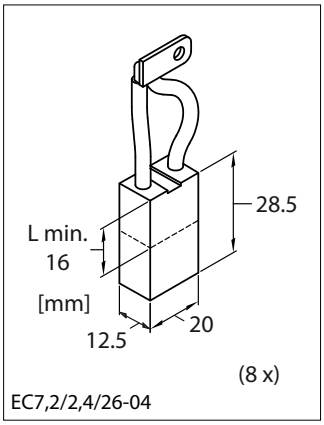
Batterikapacitet, batterikablar

Batterikapasitet, batterikabler

Akkukapasiteetti, akkukaapelit

Boegschroef	**Toe te passen accu('s)**		Totale lengte plus- en minkabel	Draaddoorsnede	Zekering	
	Minimaal	Maximaal			'traag'	Vetus art. code
Bow thruster	**Battery capacity required**		Total length of plus- and minus cable	Cable cross-section	Fuse	
	Minimum	Maximum			'slow blow'	Vetus art. code
Bugschraube	**Zu verwendende Akkus**		Gesamtlänge Plus- und Minuskabel	Drahtdurchschnitt	Sicherung	
	Minimum	Maximum			'träge'	Artikelnummer
Hélice d'étrave	**Batterie(s) à utiliser**		Longueur totale des câbles plus et moins	Diamètre du câble	Fusible	
	Minimum	Maximum			'lent'	code d'art. Vetus
Hélice de proa	**Batería(s) a aplicar**		Largo total cable positivo y negativo	Diámetro de hilo	Fusible	
	Mínimo	Máximo			'lento'	Código de art. Vetus
Elica	**Batteria(e) da usare**		Lunghezza totale cavo positivo e negativo	Diametro cavi	Fusibile	
	Minimo	Massimo			'a tempo'	Vetus codigo art.
Bovpropel	**Batterikapacitet**		Total længde af positiv og negativ batterikabel tilsammen	Tråddiameter	Sikring	
	Min.	Max.			'træg'	Vetus artikeln
Bogpropeller	**Lämpligt batteri**		Total längd kabel till plus- och minuspol	Kabelns dimension	Säkring	
	Min.	Max.			'trög'	Vetus artikelnr
Baugpropell	**Nødvendig batterikapasitet**		Total lengde pluss- og minuskabel	Ledningtverrsnitt	Sikring	
	Min.	Maks			'treg'	Vetus art. kode
Keulapotkuri	**Vaadittava akkukapasiteetti**		'Miinus'- ja 'plus"-kaapeleiden kokonaispituudet	Kaapelikoko	Sulake	
	Minimi	Maksimi			hidas	Vetus koodi
BOW16024D 160 kgf - 24 V	CCA 950 - 24 V 125 Ah-12 V BCI 4D - 950 125 Ah-12 V BCI 4D - 950 2 x 125 Ah - 12V 2 x BCI 4D - 950	CCA 1900 - 24 V 125 Ah-12 V BCI 4D - 950 125 Ah-12 V BCI 4D - 950 125 Ah-12 V BCI 4D - 950 125 Ah-12 V BCI 4D - 950 4 x 125 Ah - 12V 4 x BCI 4D - 950	0 - 29 m 0 - 85 ft	120 mm² AWG 0000	355 A	ZE355





BOW16024D **Service onderdelen** **Service parts**

pos.	qty	part	benaming	description
1	1	SET0079	Elektromotor 7 kW - 24 V compl. met relais	Electromotor 7 kW - 24 V c/w solenoid switches
2	1	SET0044	Set relais 24 V	Set of solenoid switches 24 V
3	1	SET0130	Set van 8 stuks koolborstels	Set of 8 pcs of carbon brushes
4	1	BPC00200	Relaiskap	Relais cover
5	1	SET0006	Set van 2 stuks kartelmoeren	Set of 2 pcs knurled nuts
6	1	BP117	Koppeling	Coupling
7	1	BP194B	Tussenflens	Intermediate flange
8	1	SET0080	Staartstuk compl.	Tailpiece compl.
9	1	SET0151	Zinkanode compl. met schroef	Zincanode c/w screw
10	1	SET0090	Schroef compl. met montageset	Propeller c/w mounting set
11	2	BP118	Pakking 2 mm	Gasket 2 mm
12	1	BP119	Pakking 1 mm	Gasket 1 mm
13	1	BP170	V-ring	V-ring
14	1	TS95	Thermische beveiliging	Thermal Protection
15	1	BP256	Reserve zekering 5 A	Spare fuse 5 A

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