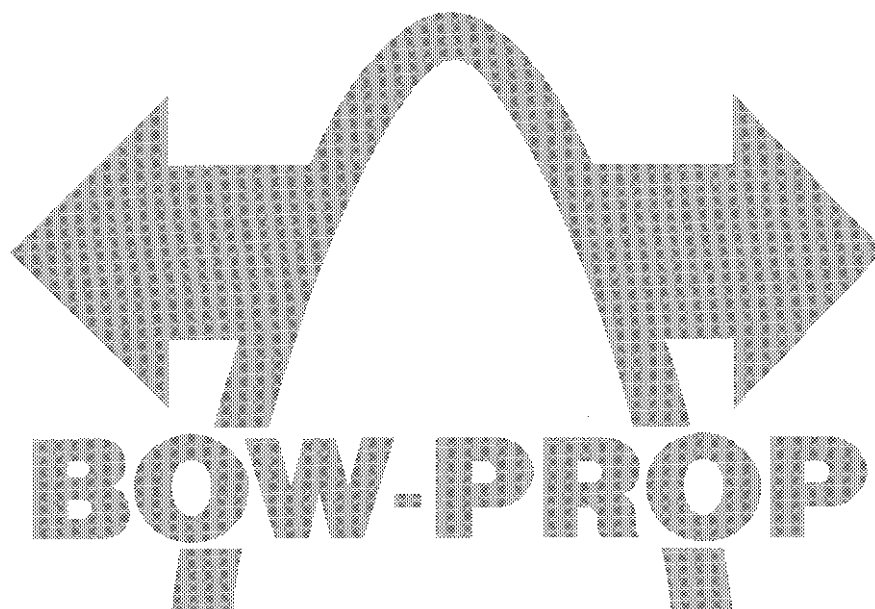


Vetus[®]

Gebruikershandleiding
Owner's Manual
Betriebsanleitung
Manuel d'utilisation
Manual de operación
Manuale per l'uso

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23 kgf, 50 kgf, 80 kgf & 130 kgf

Introduction

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:

- Make sure that the batteries are supplying the correct voltage during use.
- Ensure that the installation has been carried out correctly according to the recommendations given in the installation instructions, in particular with reference to:
 - 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.

The maximum continuous length of usage, which is also the maximum length per hour, is:

Bow thruster	'23 kgf	- 12 V	: 8 min.	at 150 A
	'50 kgf	- 12 V	: 5 min.	at 250 A
	'50 kgf	- 24 V	: 5 min.	at 125 A
	'80 kgf	- 12 V	: 3 min.	at 580 A
	'80 kgf	- 24 V	: 4 min.	at 280 A
	'130 kgf	- 24 V	: 6 min.	at 480 A ¹⁾
			4.5 min.	at 560 A ²⁾

¹⁾ with battery capacity ca. 100 Ah, thrust 1300 N (130 kgf)

²⁾ with battery capacity ca. 300 Ah, thrust 1600 N (160 kgf)

IMPORTANT!

The maximum length of usage and the thrust as specified in the technical details are based on the recommended battery capacities and battery cables; see the 'installation instructions'. 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.

Use

N.B. The bold-printed numbers refer to the numbers on the drawings on the fold-out page at the end of this manual.

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.

CARE!

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

1/2 - Switch on the main switch.

- Press once on the 'ON/OFF' switch. The indication light will go on and the bow propeller is ready for use.
- The electric motor is commanded by the selector switch.

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.

NOTE!

A time-delay can be fitted between the bow thruster motor and the switch panel. This allows the electric motor to come to a stop when a switch is made from port to starboard (or vice-versa) in one movement.

- When use of the bow propeller is no longer required, again press the 'ON/OFF' switch.
- Switch off the main switch when leaving the ship.

Maintenance

N.B. The bold-printed numbers refer to the numbers on the drawings on the fold-out page at the end of this manual.

Check the four (4) 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.
- The brushes can be taken out of the holders by releasing the retaining spring.

3 Carbon brush	Bow thruster	Motor type
AL100 ¹⁾	- '23 kgf' – 12 Volt	B11.214
BP260 ¹⁾	- '50 kgf' – 12 Volt	R125/3 – 677/633
BP261 ¹⁾	- '50 kgf' – 24 Volt	R125/3 – 677/634
BP238 ¹⁾	- '80 kgf' – 12 Volt	R160/4.7 5/4
BP238 ¹⁾	- '80 kgf' – 24 Volt	R160/4.7 5/5
BP238 ¹⁾	- '130 kgf' – 24 Volt	R178/9K
BP233 ²⁾	- '130 kgf' – 24 Volt	B4633
¹⁾ Art. code for a set of 4 carbon brushes.		
²⁾ Art. code for a set of 8 carbon brushes.		

Consult with Vetus for motor types other than those given here.

▼ Bow thruster '23 kgf' ▼

The bow thruster tailpiece has long-term lubrication.

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

- 4 Check the oil level. Also check an oil drop for colour and smell. Change the oil if the colour is black or if it smells unpleasant.
① Filler plug
② Oil level

- 5 Check the cathodic protection and if necessary renew the zinc anode. Zinc anode, article code:
type A: ZINK02
type B: BP129

- 6 In turn remove the propeller ①, the drive pin ②, the mounting bush ③ and the V-ring ④.
Check the propeller shaft seal A (2 seals) and renew if necessary. Shaft seal (1x), article code: BP55A.
Clean the propeller shaft and grease the running surface of the V-ring with 'outboard gear grease'. Fit a new V-ring and replace the mounting bush, drive pin and the propeller back on the shaft.
V-ring, article code: BP91.

▼ Bow thruster '50 kgf' and '80 kgf' ▼

Check the oil level in the oil tank regularly. The level will drop somewhat in the beginning until the tail piece is completely filled with oil.

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

- 7 Remove the propeller. Check the propeller shaft seal A (2 seals) and renew if necessary.
Shaft seal (1x), article code: BP55A.

- 8 Check the cathodic protection and if necessary renew the zinc anode.
Zinc anode, article code: BP129.

- 9 Change the oil; this must be done at least every two to four years.
250 ml oil, article code: BPEP90S.

Changing the oil:

- Remove the filler cap from the tank.
- Remove the drain plug from the tail piece.
- Allow all the oil to drain out.
- Fill the tank with fresh oil and refit the drain plug as soon as oil begins to run out.
- Fill up the tank to the correct level.

- 10 Clean the propeller shaft, grease with 'outboard gear grease' and refit the propeller on the shaft.

▼ Bow thruster '130 kgf' ▼

Check the oil level in the oil tank regularly. The level will drop somewhat in the beginning until the tail piece is completely filled with oil.

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

- 11 Change the oil; this must be done at least every two to four years.

250 ml oil, article code: BPEP90S.

Changing the oil:

- Remove the filler cap from the tank.
- Remove the drain plug from the tail piece.
- Allow all the oil to drain out.
- Fill the tank with fresh oil and refit the drain plug as soon as oil begins to run out.
- Fill up the tank to the correct level.

- 12 Check the cathodic protection and if necessary renew the zinc anode.
Zinc anode, article code: BP195.

- 13 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. Put the key back in the shaft and refit the propeller.
V-ring, article code: BP170.

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

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 lamp will not be on.

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

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

¹⁾ Depending on the model of your bow thruster, the control current fuse is either in the bow thruster motor or in the control panel, or there is one in both the bow thruster motor and in the control panel.

²⁾ Bow thruster	Fuse: 'slow blow'	Art. code
23 kgf 12 V	100 A	ZE 100
50 kgf 12 V	160 A	ZE 160
50 kgf 24 V	80 A	ZE 80
80 kgf 12 V	355 A	ZE 355
80 kgf 24 V	160 A	ZE 160
130 kgf 24 V	355 A	ZE 355

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

▼ Bow thruster '23 kgf' ▼

- The drive pin on the propeller shaft is broken because of an object in the propeller or tunnel.

Drive pin article code: BP89

Replace the pin and check the hub of the propeller for damage.

▼ Bow thruster '50 kgf' and '80 kgf' ▼

- Break pin broken because of an object in the propeller or tunnel.

Break pin article code:

'50 Kgf' (3 mm. dia. x 23.3 mm.): BP65

'80 Kgf' (4 mm. dia x 39 mm.): BP228

▼ Bow thruster '130 kgf' ▼

- The propeller blades are damaged because of an object in the tunnel.

Replacing the break pin, Bow thruster '50 kgf' and '80 kgf'

Switch off the battery main switch and disconnect the main power cables from the motor. Remove the plug from the control panel cable. Remove the four bolts holding the electric motor to the intermediate flange. Lift the motor, complete with the magnetic switches, from the intermediate flange.

- 14** Remove the retainer clamp ① from the motor axle and replace the break pin ②. Put the retainer clamp back on the axle.

Check that there are no further objects in the tunnel.

- 15** Use a spanner to check that the input shaft can be turned easily.

Turn the spindle of the electric motor so that the direction of the slot corresponds to that of the flats on the input shaft. Place the motor onto the intermediate flange and refit the bolts. Reconnect the control panel and main cables and switch on the battery main switch. Check that the bow thruster works properly.

► The bow thruster loses oil

▼ Bow thruster '23 kgf' ▼

- **If an oil leak is noticed inside the vessel:**
Check the oil seal on the input shaft of the tail piece.
- **If no oil is seen inside the vessel** then check the propeller shaft oil seal in the cover of the tail piece.

N.B. When fitting the tail piece cover both fixing screws should be installed with thread sealant (Loctite®).

▼ Bow thruster '50 kgf', '80 kgf' and '130 kgf' ▼

- **If an oil leak is noticed inside the vessel:**
First check the hose and its connections.
Check the oil seal on the input shaft of the tail piece.
- **If no oil is seen inside the vessel** then check the propeller shaft oil seal in the cover of the tail piece.

Technical data

Type	BOW2312	BOW5012	BOW5024	BOW8012	BOW8024	BOW13024
Electric motor						
Type	reversible DC motor	reversible DC motor		reversible DC motor		reversible DC motor
Voltage	12 V DC	12 V DC	24 V DC	12 V DC	24 V DC	24V DC
Current	170 A ¹⁾	350 A ²⁾	175 A ²⁾	580 A ³⁾	280 A ⁴⁾	480 A ⁵⁾
Rated output	1.5 kW	3 kW		4.7 kW		7 kW
No. of revolutions	2600 rpm	3400 rpm		3600 rpm		2900 rpm
Rating	S2–4 min. ¹⁾	S2–3 min. ²⁾		S2–3 min. ³⁾	S2–4 min. ⁴⁾	S2–6 min. ⁵⁾
Protection	IP44	IP20		IP20		IP10
Motors conform to CE (80/336/EEC, EMC - EN60945)						
Transmission						
Gears	Bevel gear	Bevel gear		Bevel gear		Bevel gear
Gear ratio	1.625 : 1	2 : 1		1.7 : 1		1.916 : 1
Lubrication	oilbath, approx 0.2 litre Structovis GHD ISO–VG 68	oilbath, approx. 0.5 litre outboard gear oil EP 90		oilbath, approx. 0.5 litre outboard gear oil EP 90		oilbath, approx. 0.5 litre outboard gear oil EP 90
Housing	bronze	bronze		bronze		bronze
Propeller						
Diameter	126 mm (5'')	178 mm (7'')		178 mm (7'')		246 mm (9.7'')
No. of blades	4	3		3		3
Blade area ratio Fa/F	0.56	0.55		0.55		0.56
Profile	symmetrical	symmetrical		symmetrical		symmetrical
Material	polyacetal (Delrin ®)	polyacetal (Delrin ®)		polyacetal (Delrin ®)		polyacetal (Delrin ®)
Rated thrust	230 N (23 kgf,52 lbf)	500 N (50 kgf, 112 lbf)		800 N (80 kgf, 180 lbf)		1300 N (130 kgf, 292 lbf) ⁵⁾
Control circuit						
Fuse	5 A	5 A		5 A		5 A
Current solenoid switches	2.8 A	1.5 A	0.8 A	2.8 A	1.4 A	1.4 A
Control circuit wires	1.5 mm ² (14 AWG)	1.5 mm ² (14 AWG)		1.5 mm ² (14 AWG)		1.5 mm ² (14 AWG)
Standard extension cable	6 m (19'8'')	6 m (19'8'')		6 m (19'8'')		6 m (19'8'')
Thrust-tunnel						
Steel model	O.D. 139.7 mm, dimensions : wall thickness 4 mm	O.D. 194 mm, wall thickness 5.6 mm		O.D. 194 mm, wall thickness 5.6 mm		O.D. 267 mm, wall thickness 7.1 mm
treatment :	blasted, coated with: 'International' Interplate NFA760/NFA761 primer Washprimer, suitable for all kinds of protection systems.					
Plastic model	O.D. 140 mm, wall dimensions : thickness 4 mm	I.D. 185 mm, wall thickness 5 mm		I.D. 185 mm, wall thickness 5 mm		O.D. 264 mm, wall thickness 7 mm
material :	glass fibre reinforced polyester					
Aluminium model	O.D. 140 mm, wall dimensions : thickness 4 mm	I.D. 185 mm, wall thickness 5.5 mm		I.D. 185 mm, wall thickness 5,5 mm		O.D. 264 mm, wall thickness 7 mm
material :	aluminium, 6060 AlMgSi 0,5					
Weight						
Excl. thrust-tunnel	10 kq (22 lbs)	20 kq (44 lbs)		29 kq (64 lbs)		46 kq (101 lbs)

Length of usage :

¹⁾ 8 min. continuously or max. 8 min. per hour at 150 A

²⁾ 5 min. continuously or max. 5 min. per hour at 250 A (12 Volt) resp. 125 A (24 Volt)

³⁾ 3 min. continuously or maximum 3 min. per hour at 580 A.

⁴⁾ 4 min. continuously or maximum 4 min. per hour at 280 A.

⁵⁾ With battery capacity ca. 100 Ah and thrust of 1300 N (130 kgf) @ 2900 rev/min: 6 min. continuous or maximum of 6 min. per hour at 480 A.

With battery capacity ca. 300 Ah and thrust of 1600 N (160 kgf) @ 3250 rev/min: 4.5 min. continuous or maximum of 4.5 min. per hour at 560 A.

Electrisch schema's

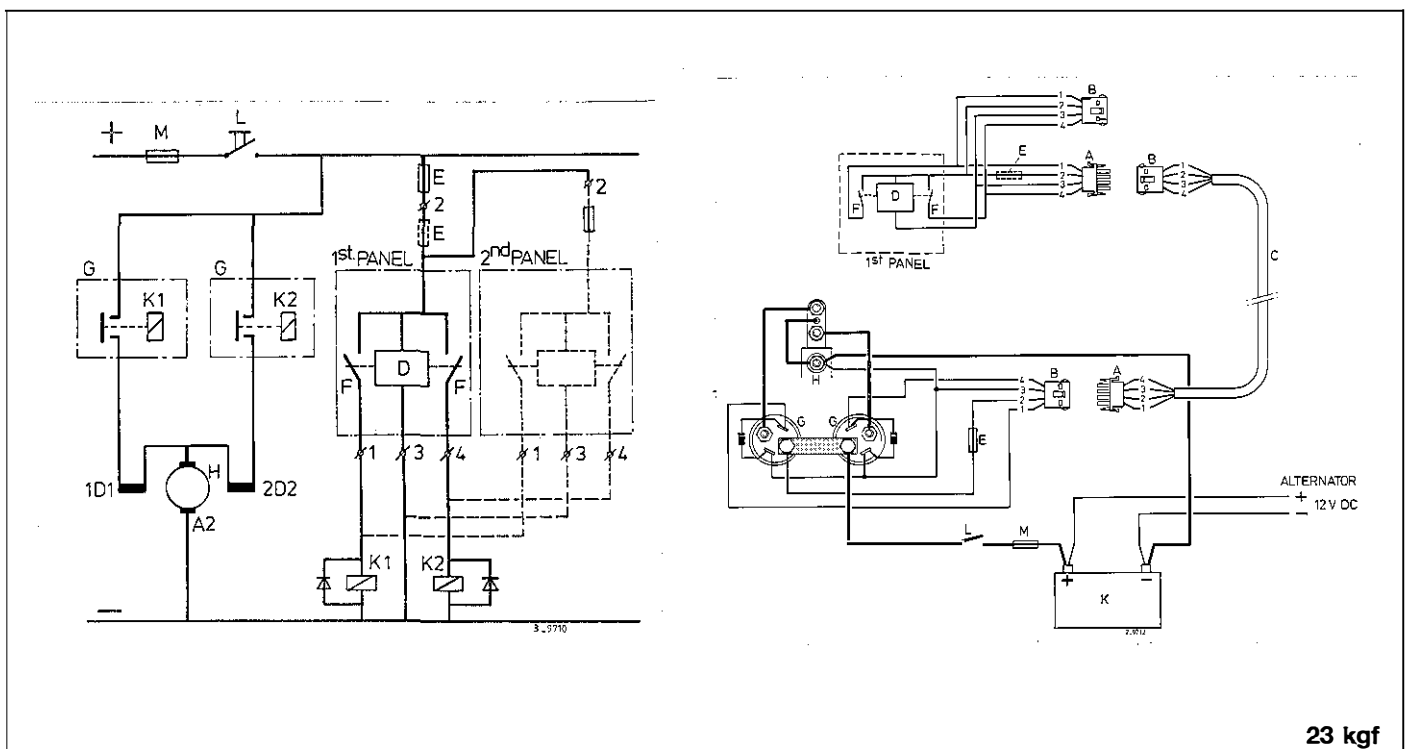
Wiring diagrams

Schaltschemas

Circuits électrique

Esquemas eléctricos

Schema elettrico



A Steker
B Kontrasteker
C Verlengkabel
D Besturingsschakeling
E Zekering
F Relaiscontacten
G Magneetschakelaar
H Elektromotor
K Accu
L Hoofdschakelaar
M Zekering

A Plug
B Socket
C Extension cable
D Control circuit
E Fuse
F Relay contacts
G Solenoid switch
H Electromotor
K Battery
L Main switch
M Fuse

A Stecker
B Kontrastecker
C Zwischenkabel
D Steuerschaltung
E Sicherung
F Relaiskontakte
G Relais
H Elektromotor
K Batterie
L Hauptschalter
M Sicherung

Kleurcode bedrading:

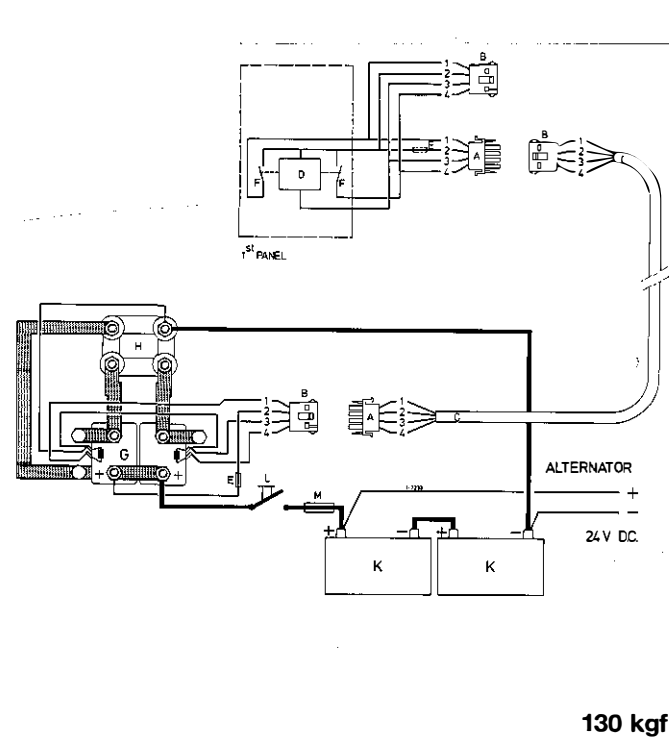
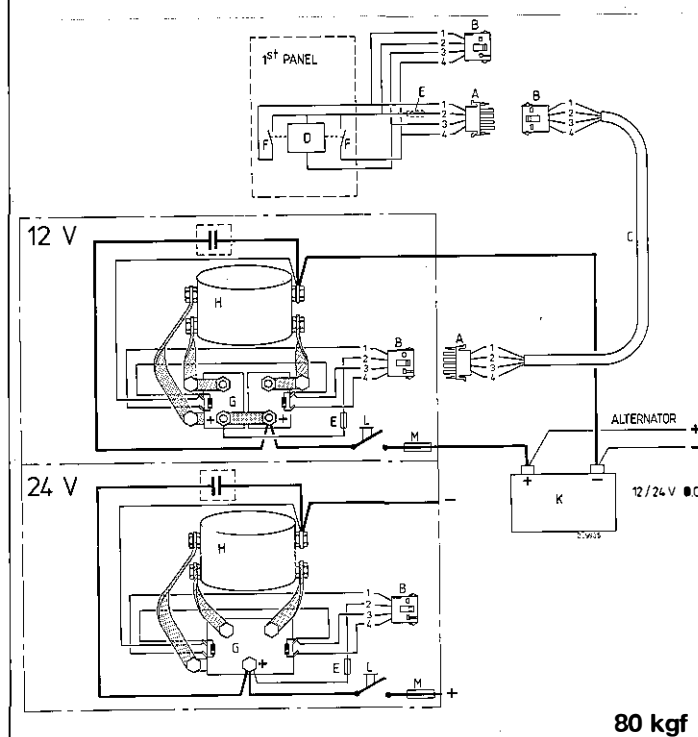
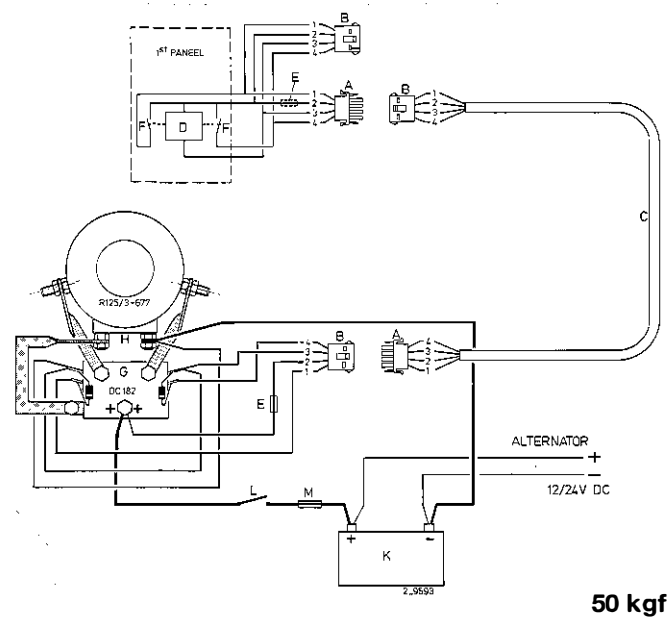
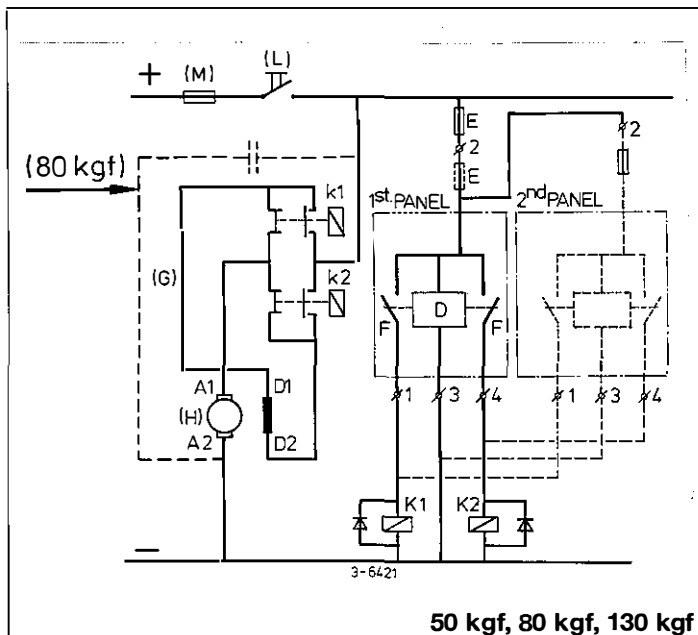
1 Blauw
2 Rood (+)
3 Zwart (-)
4 Wit

Wiring colour code:

1 Blue
2 Red (+)
3 Black (-)
4 White

Farbcode für die Bedruchtung:

1 Blau
2 Rot (+)
3 Schwarz (-)
4 Weiß



A Prise mâle
B Prise femelle
C Câble de branchement
D Circuit de commande
E Fusible
F Contact du relais
G Contacteur solénoïde
H Moteur électrique
K Batterie
L Interrupteur principal
M Fusible

A Clavija macho
B Clavija hembra
C Cable prolongador
D Circuito de control
E Fusible
F Contactos del relé
G Interruptor de solenoide
H Electromotor
K Bateria
L Interruptor principal
M Fusible

A Spina maschio
B Spina femmina
C Prolunga
D Circuito pilota
E Fusibile
F Contatti di relé
G Interruttore solenoidale
H Motore elettrico
K Batteria
L Interruttore principale
M Fusibile

Code de couleur des câbles:

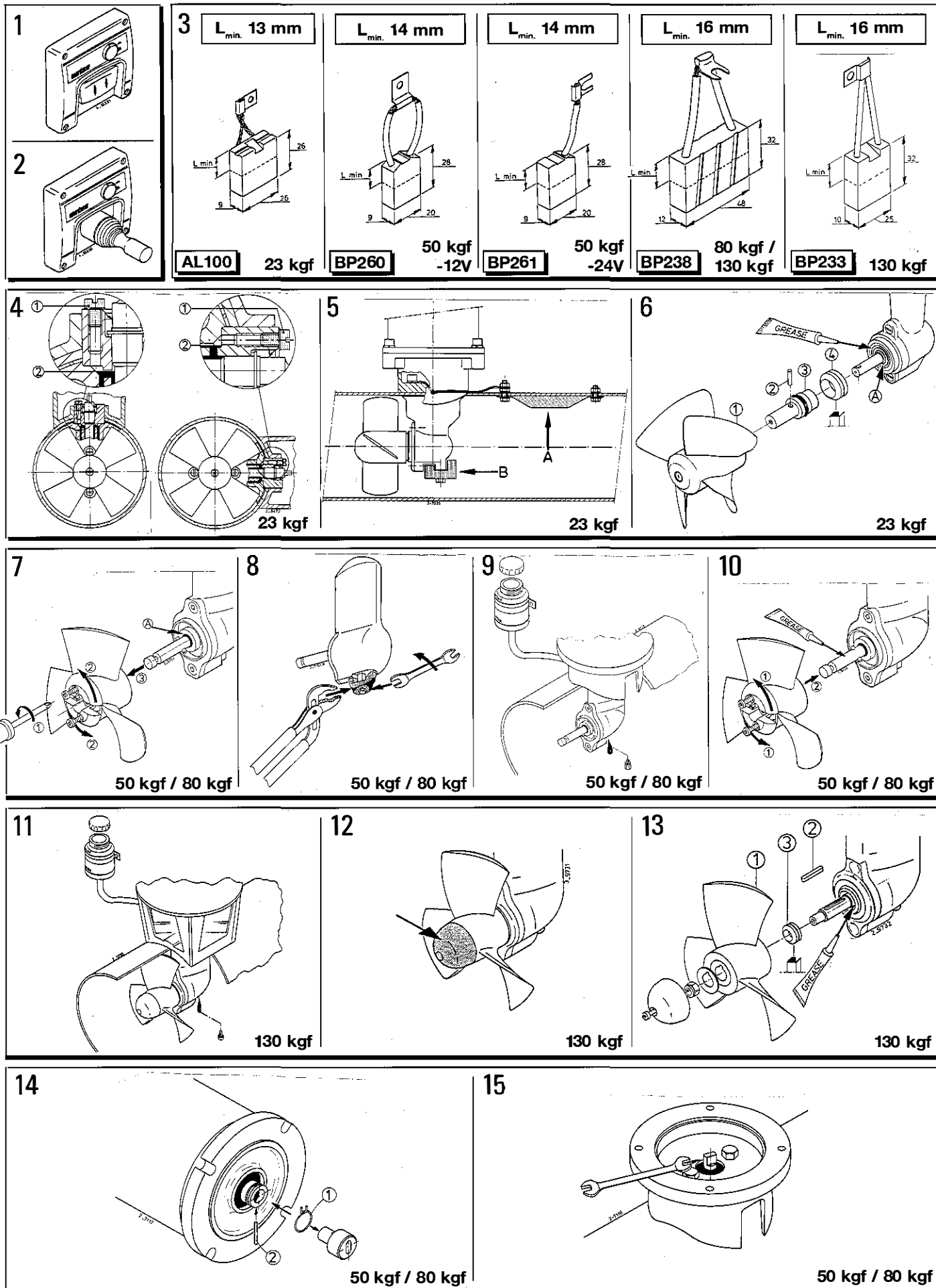
- 1 Bleu
- 2 Rouge (+)
- 3 Noir (-)
- 4 Blanc

Código de color de los cables:

- 1 Azul
- 2 Rojo (+)
- 3 Negro (-)
- 4 Blanco

Codice colori cavi:

- 1 Blu
- 2 Rosso (+)
- 3 Nero (-)
- 4 Bianco



vetus den ouden n.v.

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