DOCKING

Thrusters can take the stress out of docking by giving you sideways control of the movement and position of the bow and the stern of your boat. They work by rotating a propeller (at very high speed and power) in a submerged tube or a housing mounted athwartships (across the boat), and located near the bow and/or the stern.

A simple control panel (usually a joystick) allows you to push the bow and/or stern sideways, to resist the force of a crosswind and cross current, while you are docking or manoeuvring in close quarters (getting in or out of the marina).

What thrusters will do for you and your boat

- Allow you to maintain control while docking and manoeuvering, even into a very tight slip in a crowded marina
- Allow a single crew member to pick up and secure the dock lines while you move the boat sideways from one piling or mooring buoy to the next - slowly, carefully, quietly and with very little pushing, pulling or shouting.
- Allow you and your one-person crew to handle and control a much bigger and more comfortable boat
- Avoid the possibility of hitting another boat, a dock or a piling, that might cause expensive damage to your boat, another boat or the marina facilities
- Minimize the risk of a crew member being injured during docking manoeuvers in difficult conditions
- Allow you to handle your boat with the same expertise, grace and panache as the other captains whose boats are equipped with VETUS thrusters
- Make boating more fun

VETUS offers a solution for each and every boat. From small to big boats, with a shallow or deep draft, slow or fast, electrically or hydraulically driven. New products are continuously introduced and existing products are frequently updated, so please go to www.vetus.com for the latest developments.

HOW TO CHOOSE THE CORRECT BOW AND STERN THRUSTER

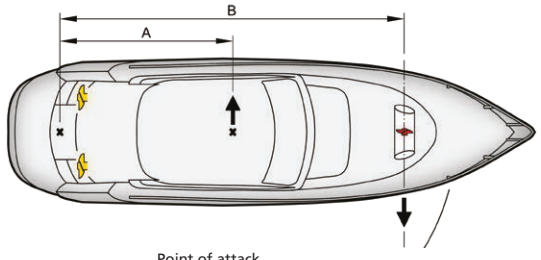
After you have selected your type of thruster, the following tool can be used to calculate the required thrust force or you can use the table below to select your ideal thruster.

The influence of the wind
The force applied to the boat by the wind is determined by the wind speed, the wind angle and the lateral wind draft area of the boat. If the wind blows at right angles to the boat, this wind pressure is most difficult to counter. However, this is seldom the case and as most boat superstructures are fairly streamlined, a reduction factor of 0.75 is generally applied, when calculating the wind pressure.

The turning moment
The turning moment is calculated by multiplying the wind force by the distance (A) between the centre of effort of the wind and the point of rotation of the boat. In order to simplify this somewhat: for the vast majority of boats a rule of thumb may be applied that the turning moment is calculated by multiplying the wind force by half of the boat's overall length.

The thrust force
It is the thrust force which is the true measure of a bow thruster's usefulness and not the output of the electric or hydraulic motor in kW or HP. The nominal thrust force is a combination of the motor power, the shape of the propeller and the efficiency losses inside the tunnel. VETUS electrical bow thrusters have a very high thrust of between 17 and 23 kgf per kW motor power. The required thrust force to counter the effects of the wind is now calculated by dividing the turning moment by the distance (B) between the centre of the bow thruster tunnel and the pivot point of the boat.

Note
The further forward the tunnel can be positioned, the greater effect the thruster will have.



Centres of rotational effort

Wind force Beaufort	Description	Wind speed m/s	Wind pressure N/m² - (kgf/m²)
4	moderate breeze	5,5 to 7,9	20 to 40 - (2,0 to 4,1)
5	fresh breeze	8,0 to 10,7	41 to 74 - (4,2 to 7,5)
6	strong breeze	10,8 to 13,8	75 to 123 - (7,7 to 12,5)
7	near gale	13,9 to 17,1	125 to 189 - (12,7 to 19,2)
8	gale	17,2 to 20,7	191 to 276 - (19,4 to 28,2)

Calculation example
The boat has an overall length of 11 metre and the lateral wind draft measures 18 m². It is required that the bow can be controlled easily when wind force Beaufort 5 applies.
At wind force Beaufort 5, the wind pressure is: Rho= 41 to 74 N/m², i.e. Rho (average) = 60 N/m².

The required torque is
T = wind pressure x wind draft x reduction factor x distance centre of effort to pivot point, (=approx. half the ship's length)
T = 60 N/m² x 18 m² x 0,75 x (11 x 0,5) m = 4455 Nm

The required thrust force is calculated as follows

$$F = \frac{\text{torque}}{\text{distance between centre of bow thruster and the pivot point of the boat (with the transom as pivot of the boat)}} = \frac{4455\ \text{Nm}}{10{,}5\ \text{m}} = 420\ \text{N (42 kgf)}$$

The most suitable VETUS bow thruster is for this particular vessel is the 45 kgf (25 kgf in the case of Beaufort 4 and 75 kgf in the case of Beaufort 6). Always bear in mind that the effective performance of a bow thruster will vary with each particular boat, as the displacement, the shape of the underwater section and the positioning of the bow thruster will always remain variable factors.

As a rule of thumb it can be assumed that the stern thruster may be "one model smaller" than the bow thruster model, as it has been calculated. Therefore, in this case a stern thruster type 35 kgf will be the correct model. Below is a selection table of bow thruster models against recommended boat length. Please note that this table is given for general guidance only and the calculation shown above should be used whenever possible. If you are in any doubt about the best thruster for your boat, your VETUS dealer will be glad to help you with the decision.

Selection table thrust force - boat length

Metre:	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	.....	43
Feet:	20	26	33	39	46	52	59	66	72	79	85	92	98	105	112	.....	141
25 kgf																	
35 kgf																	
45 kgf																	
55 kgf**																	
60 kgf																	
75 kgf																	
95 kgf**																	
125 kgf																	
160 kgf**																	
220 kgf																	
230 kgf*																	
285 kgf																	
310 kgf*																	
410 kgf*																	
550 kgf*																	

* only available as hydraulically driven bow thruster
** available as hydraulically and electrical driven bow thruster

The world of VETUS thrusters - a continuum of power outputs, sizes

DC BOW AND STERN THRUSTERS

The original recreational boat thruster, developed and refined over 30 years of hard work on boats ranging from 15 to 90 feet.

- On-off, port-starboard controls.
- Simple and intuitive to operate
- Lowest cost, simplest installation, easy retrofit
- A range of eleven thrusters, with thrust outputs ranging from 25 kgf
- to 285 kgf
- Battery powered at 12, 24 and 48 Volts
- Run time: 2-4 minutes continuous or combined in one hour
- Motor technology: direct current, series wound with carbon brushes

Turn to page 175 for detailed information

Suitable for:
boats 5,5 to 29 meter

BOW PRO DC-AC INDUCTION BOW AND STERN THRUSTERS

The leading edge of thruster development, but utilizing well proven components and technology. For boats ranging from 18 to 50 feet.

- Resistant to damage from misuse and overuse, with heat sensing and self-regulating electronics
- Proportional joysticks allow you to vary the effective power output of the thruster for more boat control.
- Simple and intuitive to operate, with a small self learning curve on adjusting the thrust
- The same installation process as a standard VETUS DC thruster, but with some simple and well documented panel set-up procedures
- A range of 18 thrusters, with power outputs from 30 kgf to 130 kgf
- Battery powered at 12 and 24 Volts
- Run time: 10 minutes (minimum) at full power with longer runtimes at reduced power, ultimately limited by battery capacity and recharge rate
- Motor technology: efficient, sealed, induction motors (with no carbon brushes) giving maximum run time on a charged battery bank

Turn to page 178 for detailed information.

Suitable for:
boats 6 to 16 meter

RIM DRIVE DC INDUCTION THRUSTERS

If you treasure peace, perfect peace, on gentle waters, or need to move with stealth on troubled waters, the world's quietest thrusters are for you. For boats ranging from 40 to 60 feet.

- Proportional joysticks allow you to vary the effective power output of the thruster for more boat control.
- Resistant to damage from misuse and overuse, with heat sensing and self-regulating electronics
- Simple and intuitive to operate, with a small learning curve on adjusting the thrust
- A slightly different installation process from a standard VETUS DC thruster, but no new skills required.
- A range of two thrusters with power outputs of 125 kgf and 160 kgf
- Battery powered at 48 Volts
- Runtime: 10 minutes minimum at full power with longer runtime at reduced power, on minimum recommended battery bank, but easily extended by increasing battery capacity

Turn to page 180 for detailed information.

Suitable for:
boats 14 to 22 meter

and capabilities. The right thrusters for every boat and every situation.

EXTENDED RUNTIME DC BOW AND STERN THRUSTERS

An extension of the basic, time-tested DC thruster, developed for use in integrated boat control systems requiring long runtimes at high power outputs. For boats ranging from 36 to 75 feet.

- On-off, port-starboard controls
- Simple and intuitive to operate
- Simple installation, easy retrofit
- 5 models with power outputs ranging from 95 kgf to 220 kgf
- Battery powered at 12 and 24 Volts
- Run time 7-10 minutes continuous or combined in one hour.
- Motor technology: direct current, series wound with carbon brushes

Turn to page 182 for detailed information

Suitable for:
boats 5,5 to 29 meter

IGNITION PROTECTED DC BOW AND STERN THRUSTERS

An extension of the basic, time-tested DC thruster, but the only electric thruster type suitable for use in compartments containing gasoline / petrol engines, tanks and fuel lines, propane tanks and lines, jet skis/ pwcs or outboard engines and their fuel tanks, as the motor is encased to prevent explosive fumes reaching its interior. For boats ranging from 16 to 60 feet.

- On-off, port-starboard controls
- Simple and intuitive to operate
- Simple installation (regular + encasement), easy retrofit
- 10 models with power outputs ranging from 25 kgf to 155 kgf
- Battery powered at 12 and 24 Volts
- Run times 2-4 minutes continuous or combined in one hour
- Motor technology: direct current, series wound with carbon brushes

Turn to page 183 for detailed information

Suitable for:
boats 4,5 to 18 meter

RETRACTABLE DC BOW AND STERN THRUSTERS

The thruster to select when your boat's shallow draft does not allow a conventional bow tunnel or stern tube to be adequately submerged. A VETUS DC thruster mounted on a swing mechanism that extends below the boat prior to operation and retracts back into the hull after use. For boats ranging from 25 to 60 feet.

- On-off, port-starboard controls with automatic deployment and retraction
- Simple and intuitive to operate
- A unique installation process requiring careful measurement, cutting and fitting in accordance with the detailed instructions provided
- 6 models with power outputs ranging from 55 kgf to 160 kgf
- Battery powered at 12 and 24 Volts
- Run times 2-4 minutes continuous or combined in one hour
- Motor technology: direct current, series wound with carbon brushes

Turn to page 184 for detailed information

Suitable for:
boats 5,5 to 29 meter

HYDRAULIC THRUSTERS

Thrust whenever you need it, for as long as you need it -, is the defining characteristic of these powerful machines and their systems. Built with industrial grade components and ideal for commercial and recreational heavy-duty applications. For vessels ranging from 35 to 120 feet.

- Controls can be on-off/ port-starboard, two stage with half-power hold détentes, proportional or a computer managing station-holding or integrated boat-control
- Made for very hard work - long lived, reliable, accustomed to abuse and highly resistant to damage
- Specialist installation required due to complex components
- 7 models with power outputs ranging from 55 kgf to 550 kgf
- Powered by a prime mover engine(s)
- Continuous runtime
- Motor technology: hydraulic

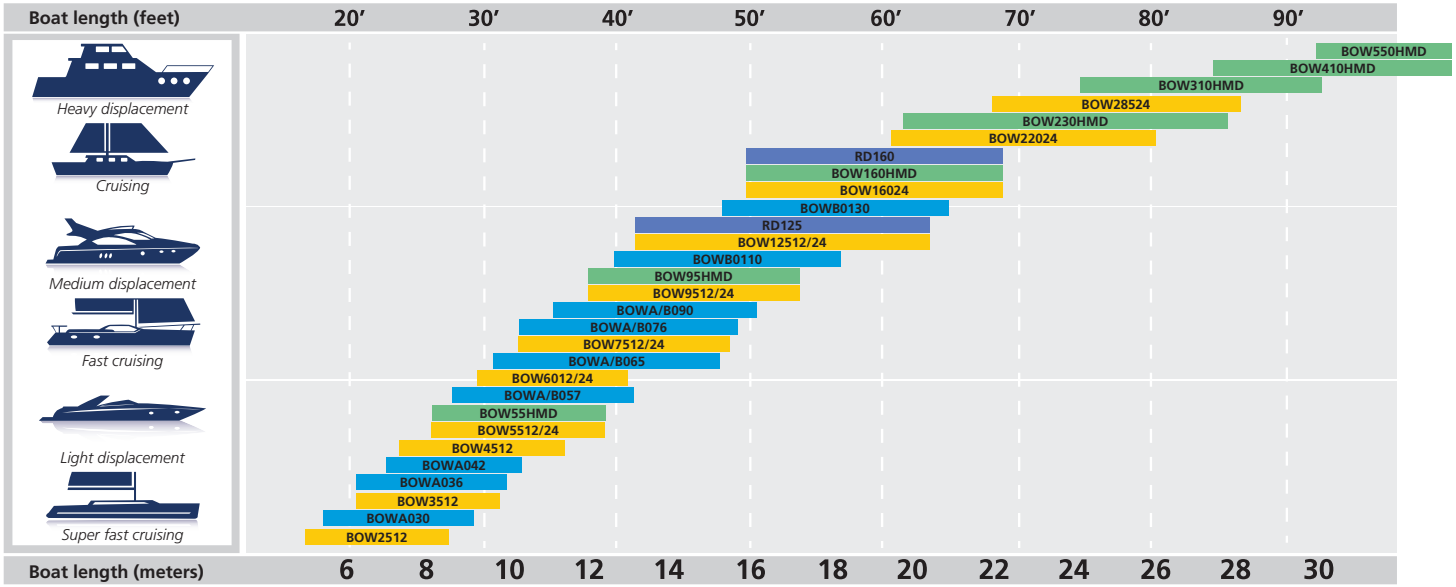
Turn to page 186 for detailed information

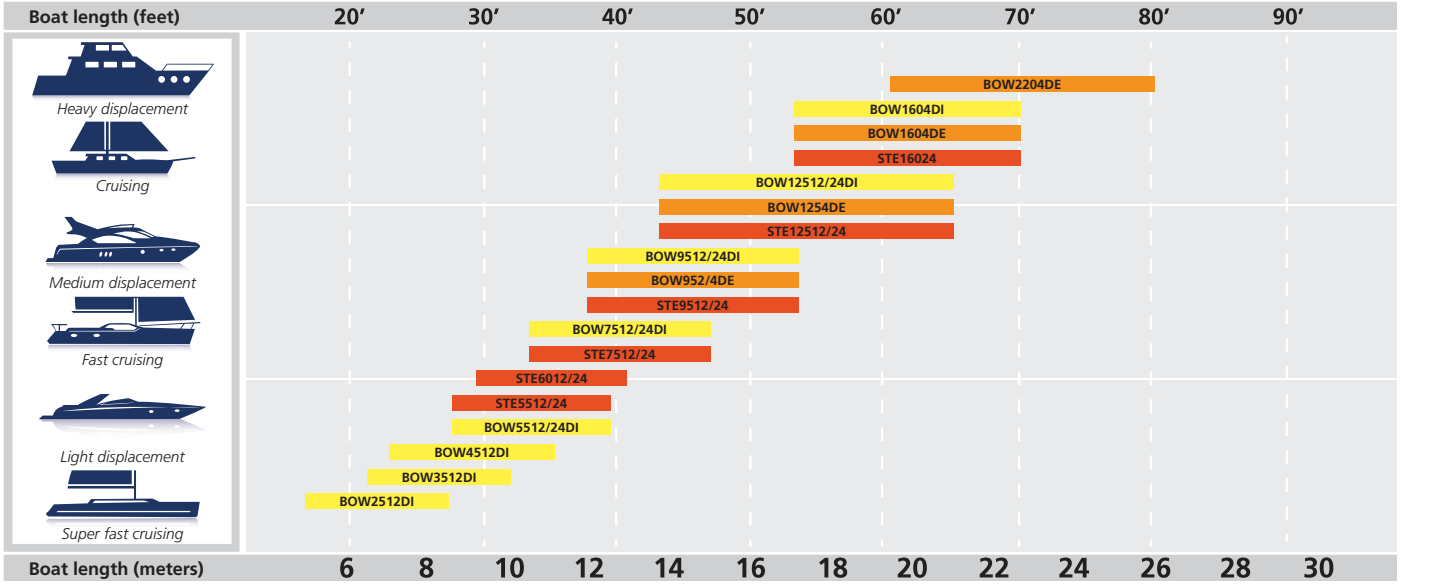
Suitable for:
boats 8,5 to 40 meter

The world of VETUS thrusters

Specifications	DC THRUSTERS	BOW PRO DC-AC THRUSTERS	RIMDRIVE DC THRUSTERS	HYDRAULIC THRUSTERS	EXTENDED RUNTIME DC THRUSTERS	IGNITION PROTECTED DC THRUSTERS	RETRACTABLE DC THRUSTERS
Sound	++	+++	++++	+++	++	++	++
Energy use	++	+++	+++	++++	++	++	++
Proportional	No	Yes	Yes	Yes	No	No	No
Maintenance	carbon brushes + anode + power circuit check	anode + power circuit check	anode + power circuit check	anode + hydraulic lines check	carbon brushes +anode + power circuit check	carbon brushes + anode + power circuit check	carbon brushes + anode + power circuit check

GLOBAL OVERVIEW PER TYPE





DC THRUSTERS | EXTENDED RUNTIME DC THRUSTERS | BOW PRO DC-AC THRUSTERS | RIMDRIVE THRUSTERS

IGNITION PROTECTED DC THRUSTERS | RETRACTABLE DC THRUSTERS | HYDRAULIC THRUSTERS