

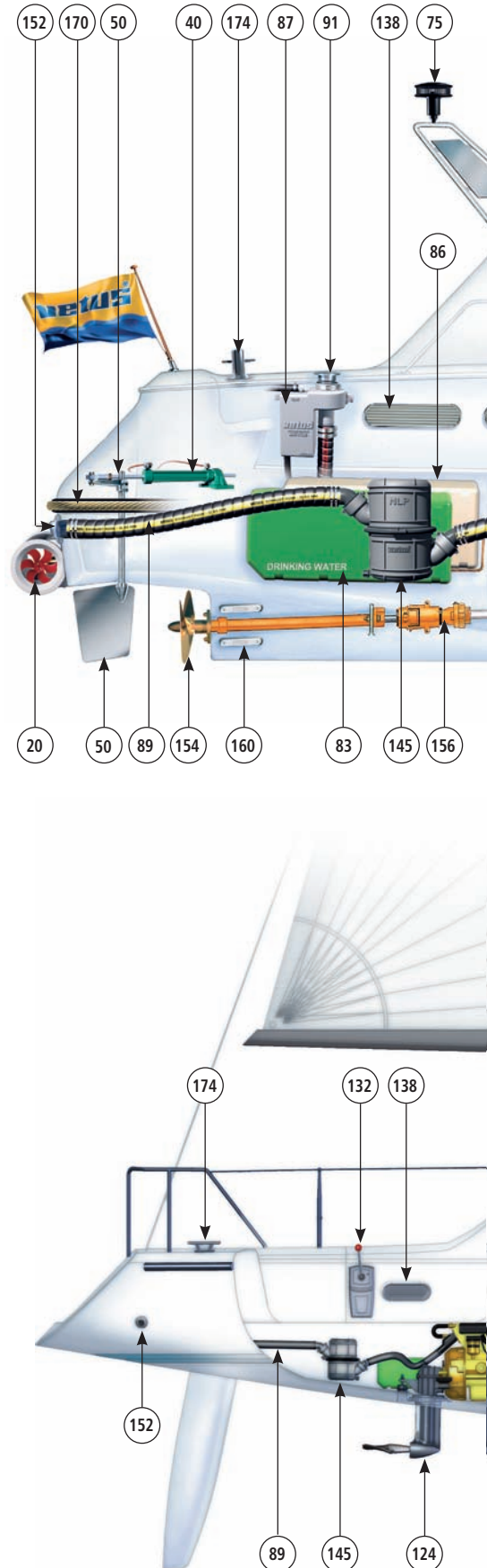


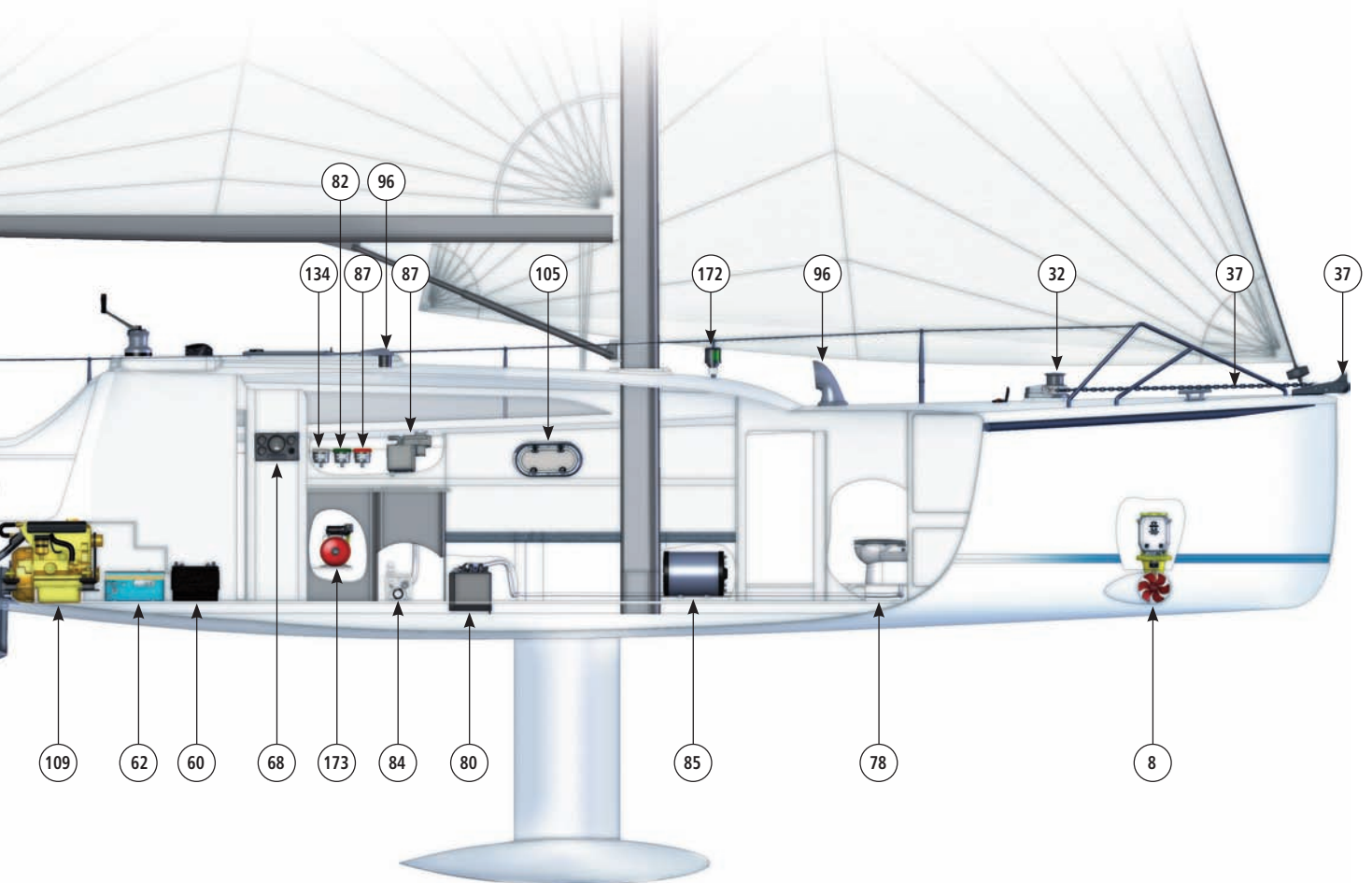
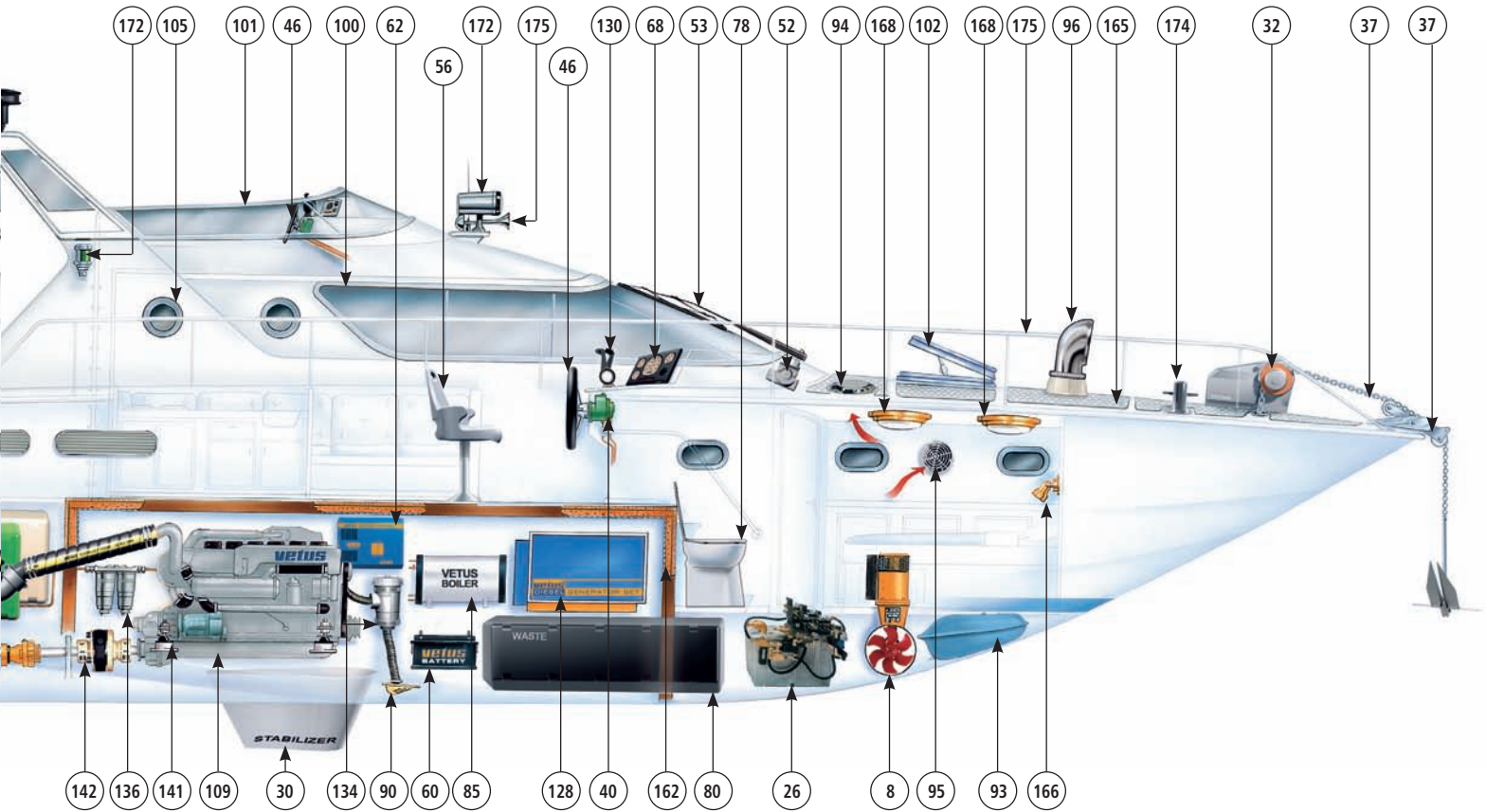


<b>A</b> Air conditioning hose	89
Air vents (anti siphon)	82,153
Acoustic materials	162,163
Aluminium anodes	160,161
Ammeters	70,72
Anchor chain	37
Anchor windlass accessories	37,38,39
Anchor windlasses (electric)	34-36
Anchor windlasses (hydraulic)	32,33
Anchor windlass (manual)	36
Anodes	160,161
Automatic change-over device	64
<b>B</b> Ball valves	90,91
Batteries	60,61
Battery boxes	59
Battery cables	59
Battery chargers	62-63
Battery splitter	59
Battery switches	19,59
Battery terminals	59
Battery watch	62
Bilge pumps	173
Bilge water/oil separator	173
Blower hose	89,138
Blowers	140
Boat security systems	137
Bollards	174
Bow thruster accessories	18,19
Bow thruster control panels	14-17
Bow thrusters (electric)	8-13
Bow thrusters (hydraulic)	22,23
Bow rollers	37
Breather nipples	90
Bulbs	167,168,169
<b>C</b> Cabin entries	101
Cable terminals	59
Cables (battery)	59
Cables (push-pull)	133
Calorifier hose	88
Calorifiers	85
Capstan	33
Ceiling lights	166-169
Chain stopper	37
Clear view screens	52
Cleats	174
Connection kits for rigid tanks	83
Cooling water hose	89
Cooling water strainers	134,135
Combi speed log depth	75
Compass (electronic)	74
Couplings (flexible)	142,143
Cowl ventilators	96-99
Cutlass bearings	158
<b>D</b> Deck entries	101
Deck hatches	101-104
Deck plugs	175
Deck ventilators	94,95
Diesel engines	109-123
Diesel-hydraulic propulsion	27
Dimmers & switches	167
Diode splitter	62
Dorade ventilators	95-99
Dual station units	132
<b>E</b> Electro-hydraulic power packs	29
Electro-hydraulic pumps	49
Electric propulsion	126,127
Electric remote control	39
Electric toilets	78,79
Electrically operated ball valves	91
Electro-hydraulic hatch lifters	51
Electronic compass	74
Electronic compass/GPS	74
Electronic engine controls	130,131
Emergency propulsion	27
Energy consumption gauge	127
Engine instrument panels	68,69
Engine instruments	68-73
Engine mountings (flexible)	141
Engine remote controls	130-133
Engine room ventilation	138,139,140
Engines	109-123
Escape hatches	102-104
Exhaust systems	144-153
Exhaust hose	89
Exhaust temperature alarm	70,72,149
Exhaust transom connectors	152
Extraction ventilators	140
<b>F</b> Fans (electric)	95
Filters ("no-smell")	82,87
Filters (sea water strainer)	134,135
Filters (water separator/fuel filter)	136

Fire port	175
Fittings	90,91
Flexible engine mountings	141
Flexible couplings	142,143
Flexible tanks	93
Follow up steering system	48
Fuel "Splash-Stop"	87
Fuel filler hose	89
Fuel filters	136
Fuel hose	88
Fuel Safe	87
Fuel tanks	84,86
Fuses & fuse holder	59
<b>G</b> Gas detector	65
Gas struts	51
Gas/water separators	149
Gauges and senders (engine and tank)	70-72
Generator sets	128,129
Goosenecks	148
GPS	74
Grab rails	175
Grey water discharge system	77
<b>H</b> Hand rails	175
Hatch adjusters	175
Hatches	102-104
Hatch lifter (hydraulic)	51
Helmsman's seats	56,57
Horns	175
Horn push button	175
Hose clamps	90
Hose connectors	91
Hose fittings	90,91
Hoses	88,89
Hour counter	70,72
Hybrid propulsion	127
Hydraulic anchor windlasses	32,33
Hydraulic bow thrusters	21-23
Hydraulic capstan	33
Hydraulic control devices	27
Hydraulic engine remote control	131
Hydraulic hose	27
Hydraulic oil	92
Hydraulic outboard steering	41
Hydraulic power pack	129
Hydraulic power steering	28
Hydraulic propulsion	27,125
Hydraulic pumps	25
Hydraulic stabilizers	30,31
Hydraulic steering systems	40-45
Hydraulic tanks	26
<b>I</b> Impellers	175
Inspection lids	83
Instruments	68-73
Inverters	62
<b>J</b> Joystick steering	50
<b>L</b> Level indicators (tanks)	71,73
Lights:	
• Ceiling	166-169
• Halogen	166,167
• Navigation	172
• Reading	167,169
• Search	172
• Underwater	168
Lock (push-button)	175
Louvered air suction vents	138,139
Lubricants	92
<b>M</b> Marine diesel engines	109-123
Marine horns	175
Messenger	170,171
Mufflers	148,151
Mushroom ventilators	95
<b>N</b> Navigation instruments	74,75
Navigation lighting	172
Non-return valve (hydraulic)	45
Non-slip deck covering	165
No-smell filters (fuel & waste)	82,87
<b>O</b> Odour-tight hoses	88
Oil cooler	28
Oils	92
Oil pressure gauge	70,72
Oil/water separator	173
Outboard steering systems	41
Plugs and sockets	175
Poly-wood sheets	164
Portholes	105-107
Power hydraulics	25-33
Power packs	29 and 129
Power steering	28
Pressurized water systems	173
Pro-Docker	16,17

Propeller shaft anodes	160,161
Propeller shaft tubes	156-159
Propeller shafts	156-159
Propellers	154,155
Push-pull cables	133
<b>R</b> Radio remote control	39
Relays for anchor windlasses	38
Remote controls for anchor windlasses	38,39
Remote controls for bow thrusters	14-17
Remote controls for engines	130-133
Remote control steering	50
Remotely controlled ball valves	91
Remotely controlled battery switch	19
Revolution counter	70,72
Rigid tanks	80,81,83,84,86
Rope fendering	170,171
Rubber bearings	158
Rubbing strakes	170,171
Rudder arms & glands	50
Rudder feedback unit	65,70,71
Rudder position indicators	65,70,71
Rudders	50
<b>S</b> Saildrive	124
Sani-processor	77
Screenwash system	54
Searchlights	172
Seat legs	56
Seats	56,57
Security system	137
Semi-traction batteries	127
Shaft anodes	160,161
Shafts	156-159
Shell ventilators	96,97
Skin fittings	90,91
Sliding hatches	101
Sound insulation	162,163
Speed/log/depth instrument	75
Splash-Stop (fuel)	87
Stabilizers	30,31
Stanchions	175
Stainless steel portholes	105
Steering systems (hydraulic)	40-45
Steering pedestal	56
Steering wheels	46,47
Stern gear	156-159
Stern thrusters	20
Strainers	134,135
Sump pump	175
Switch panels	66,67
<b>T</b> Table leg	57
Tachometer	70,72
Tank gauges and senders	73,75
Tank nipples	90,91
Tanks:	
• Drinking water - flexible	93
• Drinking water - rigid	83,84
• Fuel - rigid	84,86
• Waste water - flexible	93
• Waste water - rigid	80,81,84
Temperature gauge	70,72
Through-hull fittings	90,91
Toilets	78,79
Transom connectors	152
<b>U</b> Underwater lighting	168
<b>V</b> Vacuum relief valve	82
Valves	90,91
Ventilation	94-99
Ventilation hatches	102-104
Ventilation hose	89,138
Voltmeter	70,72
<b>W</b> Waste water control panel	82
Waste water hose	88
Waste water pump	80
Waste water tanks	80,81,84
Water hose	88
Water pressure systems	173
Water scoops	90,91
Water separators/filters	136
Water strainers	134,135
Water tanks (drinking)	83,84,93
Waterlocks	145-147
Wheels (steering)	46-47
Windspeed & direction	75
Windows (custom made)	100
Windscreens (custom made)	101
Windscreen washer system	54
Windscreen wiper controls	53,55
Windscreen wiper systems	53,55
<b>Z</b> Zinc anodes	160,161





Boat builders the world over know that the choice of equipment on their craft is not decided by price alone. The quality, safety, reliability and reputation of their product is judged on its overall performance.

Even the most meticulously built boat will eventually need service and of course, there is always the occasion when accidental damage cannot be avoided. These things can often pose problems in the country of build, but what if the boat has been sold or voyaged overseas? How can the owner ensure the level of support he expects, wherever he may be?

VETUS is proud to have built a worldwide and reliable network of importers, distributors and dealers and have expanded and refined this network over a period of more than 40 years. As a result, VETUS products can be purchased in more than 80 countries across the globe and usually from stock in more than 50.

But that is not the end of the story:

It is the VETUS philosophy that service and support should be offered with the least possible delay and at the lowest possible cost by a skilled service engineer.

Each VETUS product comes with the following inclusive benefits:

- 1) Even the simplest article is supplied with comprehensive installation and operation instructions in 6 languages.
- 2) Each year, VETUS Importers, Distributors and Dealers from around the world receive intensive training on new products.
- 3) These Distributors consider it an honour to give their own dealers similar training and to keep the most common spare parts in stock.
- 4) VETUS itself carries a permanent stock of around 6000 articles in its warehouses.
- 5) Skilled and experienced warehouse staff take care of speedy despatch to the furthest corners of the world.
- 6) An equally skilled and experienced service team provides useful information and advice, both to the dealer network and to individuals alike.
- 7) In an overall view, VETUS wants to be innovative in all of its departments. There is always something that needs improvement - or that must be invented a new - and the 12 collaborators in our R & D department are always quite busy with it.

For these reasons, we can declare with confidence that the value of each VETUS product is much greater than the cost shown on its price tag. The product alone represents value for money, but the global service which is inextricably bound up with it, make it world class. Little wonder then that VETUS is a supplier of choice, for almost all leading boat builders.

#### Head office:

**VETUS N.V.**  
Fokkerstraat 571  
3125 BD Schiedam-Holland  
Tel.: + 31 (0)10 4377700  
info@vetus.nl

**Argentina**  
Costanera Uno S.A.  
Tel.: +54 11 4312 4545  
Fax: +54 11 4312 5258  
ventas@costanerauno.com.ar

**Australia**  
McIntyre Equipment Pty Limited  
Tel.: +61 7 3356 9808  
Fax: +61 7 3356 9818  
enquiries@mcquip-equipment.com.au

**Austria**  
Bukh-Bremen GmbH  
Tel.: +49 421 535070  
Fax: +49 421 556051  
info@bukh-bremen.de

**Baltic states**  
Vator Oy  
Tel.: +358 207 812 200  
Fax: +358 969 801 46  
info@vator.fi

**Belgium**  
Hunter N.V.  
Tel.: +32 3 820 55 60  
Fax: +32 3 828 49 23  
hunter@hunter.be

**Brazil**  
Marine Office Com. Imp.  
e Rep. Ltda  
Tel.: +55-1134775655  
Fax: +55-1134775657  
marine.office@marineoffice.com.br

**Bulgaria**  
Yacht Center Varbanov Ltd.  
Tel.: +359 56 843 232  
Fax: +359 56 841 902  
mail@yachtbg.com

**Canada**  
Stright-Mackay Ltd.  
Tel.: +1 800-565-4394  
Fax: +1 800-565-8392  
info@stright-mackay.com

**China**  
Tripower International Trading  
(Shanghai) Co., Ltd. Head Office  
Tel.: +8621-6912 3208  
Fax: +8621-5917 5562  
vetus-sales@tripower.com.sg  
sha-sales@tripower.com.sg

China Beijing Office  
Tel.: +86 10 6426 3335  
Fax: +86 10 6446 8862  
vetus-sales@tripower.com.sg  
bj-sales@tripower.com.sg

China Guangzhou Branch  
Tel.: +86-20-8136 0955  
Fax: +86-20 8136 6596  
vetus-sales@tripower.com.sg  
gz-sales@tripower.com.sg

China Zhuhai Branch  
Tel.: +86-756 3222470  
Fax: +86-756 3222471  
vetus-sales@tripower.com.sg  
zh-sales@tripower.com.sg

China Xiamen Branch  
Tel.: +86-15959217720  
Fax: +86-592-5376013  
vetus-sales@tripower.com.sg  
xm-oem@tripower.com.sg

China Hangzhou Branch  
Tel.: +86-13738000560  
Fax: +86-571-86414317  
vetus-sales@tripower.com.sg

**Chile**  
Motonautica Off Road S.A.  
Tel.: +562 757 7900  
Fax: +562 757 7941

**Croatia**  
Unimar Rijeka d.o.o.  
Tel.: +385 51 623 263  
Fax: +385 51 623 264  
unimarsrl@tin.it

**Cuba**  
Edetra S.A.  
Tel.: +53 7 204 1834  
Tel.: +53 7 204 1835  
edetra@edetra.co.cu

**Cyprus**  
Mercury Divers Co. Ltd.  
Tel.: +357 25877933  
Fax: +357 25564301  
mercury@mercury.com.cy

**Czech Republic**  
Imramovsky Marine s.r.o.  
Tel.: +420 266797137  
Fax: +420 220874152  
office@imramovsky-marine.cz

**Denmark**  
Olympic A/S  
Tel.: +45 75 585 700  
Tel.: +45 75 586 307  
olympic@olympic-as.dk

**Egypt**  
Dolphin Marine  
Tel.: +2012 7959096  
Fax: +203 4252179  
info@dolphin-marine.ne

**Finland**  
Vator Oy  
Tel.: +358 207 812 200  
Fax: +358 969 801 46  
info@vator.fi

**France**  
Vetus France S.A.S.  
Tel.: +33 4 94 08 68 30  
Fax: +33 4 94 08 68 39  
courrier@vetusfrance.com

**Germany**  
Bukh-Bremen GmbH  
Tel.: +49 421 535070  
Fax: +49 421 556051  
info@bukh-bremen.de

**Gibraltar**  
M. Sheppard & Co Ltd  
Tel.: +350 75148/77183  
Fax: +350 42535  
info@sheppard.gi

**Greece**  
Vetus Hellas Ltd.  
Tel.: +30 210 4135531/413639  
Fax: +30 210 4110 639  
vetus@insitu.gr

**Hong Kong Branch**  
Tripower International (HK) Ltd.  
Tel.: +852 2341-3329  
Fax: +852 2343-1830  
vetus-sales@tripower.com.sg  
hk-sales@tripower.com.sg

**Hungary**  
Fukey Yacht Ltd.  
Tel./Fax: +36 88 432 897  
info@fukeyacht.hu

**Iceland**  
Baldur Halldórsson  
Tel.: +354 462 37 00  
Fax: +354 462 55 01  
b.h@mi.is

**India**  
Powerstones Trading Private Ltd.  
Tel.: +91 80 26582379  
Fax: +91 80 26585228  
csk.pstl@vsnl.net

**Indonesia**  
PT. Trimarine Indonesia  
Tel.: +6221-5512635  
Fax: +6221-5513382  
vetus-sales@tripower.com.sg  
pt-trimarine@tritetex.com.sg

**Ireland**  
Union Chandlery  
Tel.: +353 21 4271 643  
Fax: +353-21 4552 211  
vetus@unionchandlery.com

**Israel**  
Yamit YSB Ltd. Marine Trade Co.  
Tel.: +972 3 527 1777  
Fax: +972 3 527 1031  
office@yamitsb.co.il

**Italy**  
Vetus Italia S.R.L.  
Tel.: +39 0571 57122  
Fax: +39 0571 578 143  
info@vetusitalia.it

**Japan**  
Ogura Trading Co. Ltd.  
Tel.: +81 3 3231 8592  
Fax: +81 3 3270 8560  
hiro@ogura.co.jp

**Korea**  
SoonShin Technology  
Tel.: +82 16 3259087  
Fax: +82 55 3362983  
Boatcreator@esonshin.co.kr

*VETUS products can be purchased in more than 80 countries across the globe and usually from stock in more than 50.*



**Malaysia**  
Tri-Marine Malaysia  
Tel.: +65 90189875  
+65 96668654  
vetus\_sales@tripower.com.sg  
tmma@tritex.com.sg

**Maldives**  
Palm Tree Marine (pvt) Ltd.  
Tel.: +960 314008  
Fax: +960 332877  
ptmarine@palmtree.com.mv

Marketch Maldives  
Tel.: +960 333 1911  
Fax: +960 332 0471  
marketch@dmnet.net.mv

**Malta**  
Gauci Borda & Co. Ltd.  
Tel.: +356 21 334 255  
Fax: +356 21 343 604  
gmercieca@gauciborda.com

**Neth. Antilles**  
Budget Marine  
Tel.: +599 5 44 3134  
Fax: +599 5 44 4409  
smaarten@budgetmarine.com

**New Caledonia**  
Ets. Limousin  
Tel.: +687 274186/282295  
Fax: +687 276870  
limousin@canl.nc

**New Zealand**  
Lusty & Blundell Ltd.  
Tel.: +64 94 15 8303  
Fax: +64 94 15 8304  
sales@lusty-blundell.co.nz

**Norway**  
Univa A/S  
Tel.: +47 37 06 20 50  
Fax: +47 37 06 20 51  
sr@univa.no

**Poland**  
Parker Poland Sp. z o.o.  
Tel.: +48 22 785 11 11  
Fax: +48 22 785 09 99  
parker@parker.com.pl

**Portugal**  
Motope LDA.  
Tel.: +351 219 209 502  
Fax: +351 219 209 470  
ppereira@motope.pt

**Romania**  
S.C. Technoid SRL  
Tel.: +40 236 413 083  
Fax: +40 236 415 42  
puiu.maris@technoid.ro

**Russia**  
Vator Oy  
Tel.: +7 812 32 665 45  
Fax: +7 812 32 665 43  
nina.kukeleva@vator.fi  
info@vator.com

**Spain**  
VETUS S.A.  
Tel.: +349 3 711 9204  
Fax: +349 3 711 9204  
vetus@vetus.es

**Servië**  
Menes D.O.O.  
Tel.: +381 113594477  
Fax: +381 113591530  
voives.j@sbj.co.yu

**Seychelles**  
Adesho Marine  
Te./fax: +248 224 216  
adesho@seychelles.sc

**Singapore**  
Tripower Corporation Pte. Ltd.  
(Head Office)  
Tel.: +65 6861-1188  
Fax: +65 6861-4263  
vetus-sales@tripower.com.sg  
mgt@tripower.com.sg

**Slovenia**  
Unimar S.R.L.  
Tel.: +39 040 661 691  
Fax: +39 040 630 730  
unimarsrl@tin.it

**South Africa**  
Vetus South Africa  
Tel.: +27 21 5116742  
+27 21 5116743  
Fax: +27 21 5116740  
info@vetus.co.za

**Switzerland**  
Vetus A.G. Schweiz  
Tel.: +41 41 491 05 05/06  
Fax: +41 41 491 05 07  
vetus@bluewin.ch

**Sri Lanka**  
Neil Feranando Marine  
& Co.(Pvt) Ltd.  
Tel.: +94 11 2588234  
Fax: +94 11 2580756  
lpt@neilmarine.com

**Sweden**  
Vator AB  
Tel.: +46 854 444 270  
Fax: +46 854 444 279  
info@vator.se

**Switzerland**  
Vetus A.G. Schweiz  
Tel.: +41 41 491 05 05/06  
Fax: +41 41 491 05 07  
vetus@bluewin.ch

**Taiwan**  
Trimarine Taiwan Co. Ltd.  
Tel.: +886-7-3329388  
Fax: +886-7-3329388  
vetus-sales@tripower.com.sg  
tritex@ms74.hinet.net

**Thailand**  
Trimarine Phuket Ltd.  
Tel.: +66(076) 273324  
Fax: +66(076) 273325  
vetus-sales@tripower.com.sg  
tmphuket@tripower.com.sg

**The Caribbean**  
Island Water World  
Offshore Inc.N.V.  
Tel.: +599 544 5310  
Fax: +599 544 3299  
paulrosen@islandwaterworld.com

Performance Engines &  
Propellers Inc.  
Tel.: +787 863 9786  
perenpro@perenpro.com

Tortola B.I.V. Parts & Power Ltd.  
Tel.: +284 494 2830  
Fax: +284 494 1584  
tom@partsandpower.com

**Trinidad**  
Budget Marine  
Tel.: +1 868 634 2006  
Fax: +1 868 634 4382  
sales@budmar.co.tt

L.P. Marine and  
Industrial supplies Ltd.  
Tel.: +1 868 633 3395  
Fax: +1 868 633 3858  
lpmarine@tsitt.net.tt

**Turkey**  
Marintek Deniz Ve Yat  
Malzemeleri Ticaret A.S.  
Tel.: +90 216 317 10 10  
Fax: +90 216 317 56 56  
deniz@marintek.com.tr

**Ukraine**  
Oriyana Shipyard JV  
Tel.: +380 44 280 74 59  
Fax: +380 44 280 43 52  
yacht@oriyana.com

**United Arab. Emirates**  
Exalto Emirates Ltd.  
Tel.: +971 6 5420597  
Fax: +971 6 5421423  
info@exalto-emirates.com

**United Kingdom**  
VETUS Ltd.  
Tel.: +44 23 8045 4507  
Fax: +44 23 8045 4508  
sales@vetus.co.uk

**United States**

VETUS America  
(North American Head Office  
and Distributor for the States  
of Maryland, New Jersey and  
Delaware)  
Tel.: +1 410 712 0740  
Fax: +1 410 712 0985  
sales-service@vetus.com

VETUS Marine (Florida)  
Tel.: +1 877 783 88 73  
Fax: +1 321 453 77 11  
sales@vetusmarine.com

VETUS Marine LLC.  
(Virginia, North Carolina,  
South Carolina and Georgia)  
Tel.: +1 888 468 3887  
Fax: +1 252 222 5615  
sales@vetusmarine.com

TDC Equipment Inc.  
(Southern California, Hawaii,  
and the South West.)  
Tel.: +1 714 373 8099  
Fax: +1 714 898 1996  
info@tdcequipment.com

Svenssens Marine Distributing  
(Northern California)  
Tel.: +1 510 521 8454  
Fax: +1 510 522 0870  
info@svenssensmarine.com

Fisheries Supplies Inc.  
(Washington, Oregon, Idaho  
and Alaska)  
Tel.: +1 800 426 6930 (Toll Free)  
+1 206 632 4462  
Fax: +1 206 634 4600  
help@fisheriessupply.com

AER Supply Ltd.  
(Texas and the Gulf States)  
Tel.: +1 800 767 7606  
+1 281 474 3276  
Fax: +1 281 474 2714  
sales@aersupply.com

Marysville Marine  
Distributors Inc.  
(Michigan, Wisconsin,  
Tennessee and the Mid-West)  
Tel.: +1 810 364 7653  
Fax: +1 810 364 4112  
marketing@marysvillemarine.com

Jamestown Distributors Inc.  
(Connecticut, Massachusetts,  
New Hampshire, New York,  
Rhode Island and Vermont)  
Tel.: +1 800 497 0100  
+1 401 253 3840  
Fax: +1 800 423 0542  
+1 401 254 5829  
info@jamestowndistributors.com

**Uruguay**  
Alvaro Bermúdez Nautica  
Tel./fax: +598 2 628 8059  
alvaro@nautica.com.uy

Some drivers park their car in the smallest of spaces, as if it were some sort of sporting achievement. Others prefer to drive on and look for an easier place to park, just to avoid the stress or damage. The situation with pleasure craft is quite different: either you have to go to your own berth in the marina or proceed to the space allotted to you by the harbour master. And in both cases your most careful manoeuvres may be completely spoiled by wind and tide, resulting in scratches to the gelcoat or paint, or even worse! Even the most experienced skipper cannot always escape such things happening.



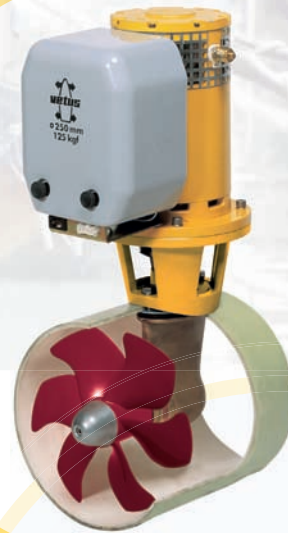
## Carefree mooring

This is the reason why an increasing number of boaters want the comfort of a bow thruster and possibly a stern thruster too. Let's be honest: who wants to see his "après sail" with family or friends spoiled by such an occurrence? And did you know that many senior boat owners are now able to enjoy their favourite hobby for many more years, thanks to the VETUS "crewman" onboard?

Therefore, it is no surprise that an increasing number of boat builders install an electric or hydraulic VETUS bow thruster as standard equipment on their craft. Existing craft can also be easily retro-fitted with a suitable VETUS bow and/or stern thruster, irrespective of whether the hull is made of wood, steel, GRP or ferro-cement.

The choice of VETUS bow and stern thrusters is a natural decision, not only for comfort and easy berthing, but also for freedom and increased boating pleasure. Even if your crew is unable to join you on the next trip, you can cast off on your own, knowing that you will be more than capable of handling the boat alone.

*Bow and stern thrusters*



# How to choose the correct bow thruster

Having a bow thruster gives you positive control of your boat, even at low speed and regardless of wind, current or tight docking conditions. VETUS offers both electrically and hydraulically driven bow thrusters, to suit a wide variety of boats. Working in close collaboration with the Maritime Institute Netherlands (MARIN), the world-famous hydrodynamic laboratory, VETUS has optimised the performance of its thrusters. This has been achieved by utilising a unique propeller blade profile, which creates little or no cavitation. As cavitation produces unwanted noise, this new blade design offers a major reduction in the operating sound levels for VETUS bow thrusters. Moreover, the application of this new propeller has reduced the current consumption by up to 10%.

This overview of the relevant factors will help in the selection of the correct model.

## GENERAL INFORMATION

VETUS bow thrusters are equipped with a streamlined bronze tail piece. This has proven to be stronger and more durable than other materials sometimes used, whilst creating the minimum of turbulence, lowest efficiency loss and lowest noise levels. The metal underwater parts are protected by a zinc anode, which is fitted as a standard. VETUS propellers are corrosion-free and on thrusters up to the 310 kgf model, are made of synthetic materials. Owing to their low weight, the maximum thrust force is obtained very quickly and with a minimum of energy. The propeller blades are specifically designed for use in a tunnel and are shaped in such a way that the thrust is equal to both starboard and port. Because of this, cavitation is largely avoided and noise levels are considerably reduced. Thruster models over 310 kgf have bronze propellers as standard, for increased strength and durability. Bronze propellers are available as an option for the 220, 230, 285 and 310 kgf models. The smaller the diameter of tunnel, the lower the resistance will be while under way. In addition, a smaller tunnel diameter allows the tunnel to be installed further forward, which increases the turning moment of the boat. Tunnels are available in aluminum, GRP or steel to suit different hull materials. VETUS bow thrusters use high efficiency electric motors for maximum power and longevity. In contrast with modified starter motors, these allow continuous running at full power for several minutes. A range of kits are available to enable any VETUS bow thruster to be used as a stern thruster.

## THE INFLUENCE OF THE WIND

The force applied to the boat by the wind is determined by the wind speed, wind angle and the lateral wind draft area of the boat. When the wind speed increases, the wind pressure increases quadratically. 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.

Wind force Beaufort	Description	Wind speed m/s	Wind pressure N/m <sup>2</sup> - (kgf/m <sup>2</sup> )
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)

## THE TURNING MOMENT

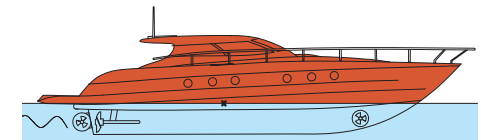
The turning moment is calculated by multiplying the wind force by the distance between the centre of effort of the wind and the centre of rotation of the boat (A).

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.

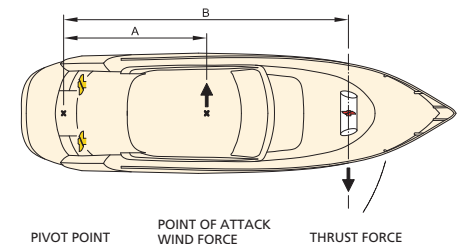
## THE THRUST FORCE

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 between the centre of the bow thruster tunnel and the pivot point of the boat (B). Note: the further forward the tunnel can be positioned, the greater effect the thruster will have.



The lateral wind draft area



Centres of rotational effort

### Calculation example

The boat has an overall length of 11 m and the lateral wind draft measures 18 m<sup>2</sup>. 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:  $r = 41$  to  $74$  N/m<sup>2</sup>, i.e.  $p$  (average) =  $60$  N/m<sup>2</sup>.

### The required torque reads:

$T = \text{wind pressure} \times \text{wind draft} \times \text{reduction factor} \times \text{distance centre of effort to pivot point, (=approx. half the ship's length)}$

$$T = 60 \text{ N/m}^2 \times 18 \text{ m}^2 \times 0,75 \times 11 \text{ m} = 4455 \text{ Nm}$$

### The required thrust force is calculated as follows:

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

**The VETUS bow thruster which is most suitable for this particular vessel is the 55 kgf model (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 be 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.**

### Selection table thrust force - boat length

25 kgf	suitable for boats from 5,5 to 8,5 metres in length
35 kgf	suitable for boats from 6,5 to 10 metres in length
55 kgf	suitable for boats from 8,5 to 12,5 metres in length
60 kgf	suitable for boats from 9 to 13 metres in length
75 kgf	suitable for boats from 10,5 to 15 metres in length
95 kgf	suitable for boats from 12 to 17 metres in length
125 kgf	suitable for boats from 14 to 20 metres in length
160 kgf	suitable for boats from 16,5 to 22 metres in length
220 kgf	suitable for boats from 19,5 to 26 metres in length
230 kgf	suitable for boats from 20 to 26,5 metres in length
285 kgf	suitable for boats from 22 to 29 metres in length
310 kgf *	suitable for boats from 22 to 29 metres in length
410 kgf *	suitable for boats from 27 to 34 metres in length
550 kgf *	suitable for boats from 33 to 43 metres in length

\* only available as hydraulically driven bow thruster





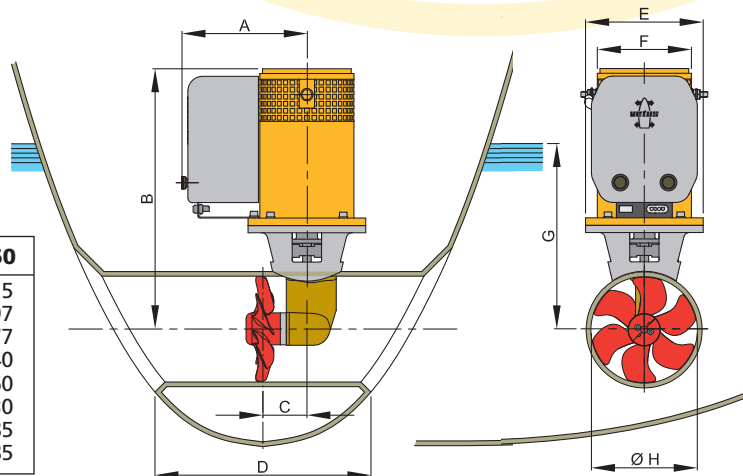
<b>Technical data:</b>	<b>BOW25</b>	<b>BOW35</b>	<b>BOW55</b>	<b>BOW60</b>
Motor	Reversible D.C. motor	Reversible D.C. motor	Reversible D.C. motor	Reversible D.C. motor
Power kW (hp)	1,5 (2)	1,5 (2)	3 (4)	3 (4)
<b>Thrust, N (kgf)</b>	<b>250 (25)</b>	<b>350 (35)</b>	<b>550 (55) - 12 V</b> <b>600 (60) - 24 V</b>	<b>650 (65) - 12 V</b> <b>700 (70) - 24 V</b>
Tunnel diameter, internal	110	150	150	185
Weight excluding tunnel, in kg	10	12	20	22
<b>Voltage, 12 Volt D.C.</b>				
Current consumption, Amps	200	205	350	280
Operating time - continuously, in minutes	4	4	4	5
- maximum per hour, in minutes	4	4	4	5
Main fuse, "slow blow", Amps	125*	160*	250	200
Batteries 12 Volt D.C., min. Ah / max. Ah	1x55 / 1x70	1x55 / 1x108	1x108 / 1x200	1x108 / 1x143
Battery cables**, total length of positive and negative cables together, m / mm <sup>2</sup>	0 - 8 / 25 8 - 12 / 35	0 - 11 / 35	0 - 12 / 70	0 - 11 / 50 11 - 16 / 70
Battery main switch: model BATSW, type	250	250	250	250
<b>Voltage, 24 Volt D.C.</b>				
Current consumption, Amps			200	140
Operating time - continuously, in minutes			4	5
- maximum per hour, in minutes			4	5
Main fuse, "slow blow", Amps			125	100
Batteries 12 Volt D.C., min. Ah / max. Ah			2x55 / 2x70	2x55 / 2x70
Battery cables**, total length of positive and negative cables together, m / mm <sup>2</sup>			0-23 / 35	0-20 / 25
Battery main switch, model BATSW, type			250	250
* This fuse is standard supply.				
** Based on VETUS battery cable				



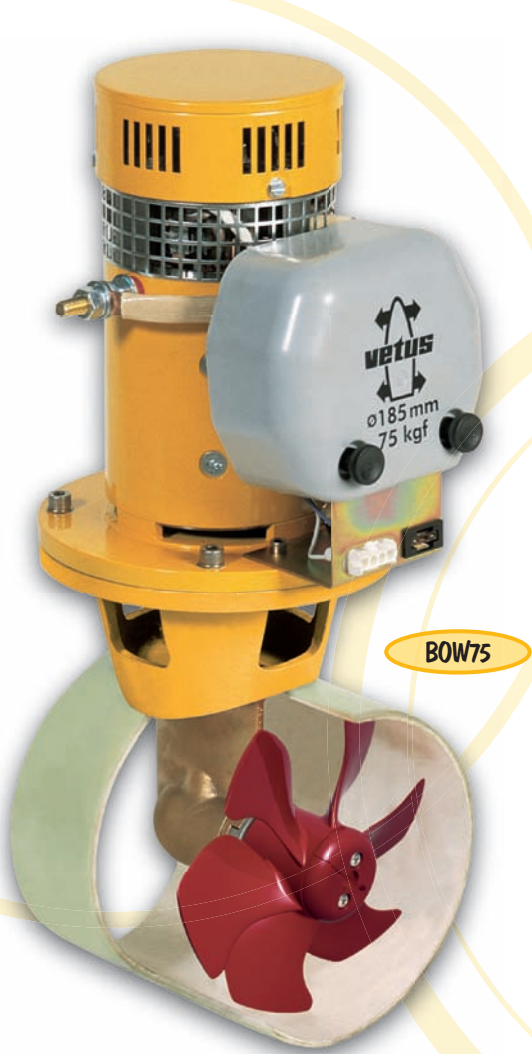
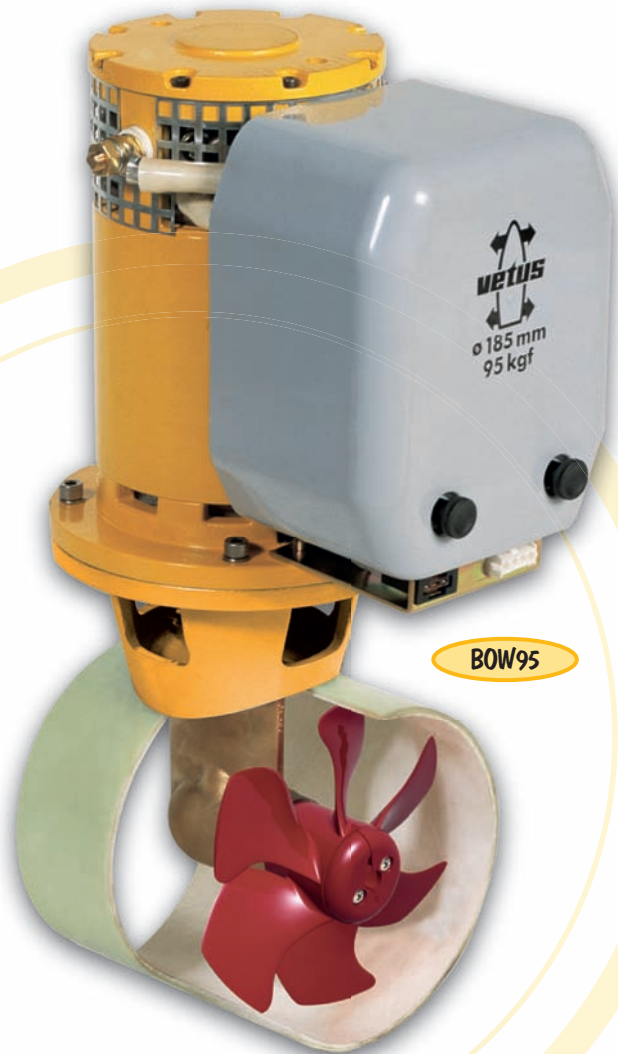
**BOW55**



**BOW60**



Sizes in mm	BOW25	BOW35	BOW55	BOW60
A	138	138	143	143,5
B	297	314	377	397
C	73	79	79	77
D min./max.	220/440	300/600	300/600	370/740
E	149	149	160	160
F	Ø 112	Ø 112	Ø 130	Ø 130
G min.	110	150	150	185
H	Ø 110	Ø 150	Ø 150	Ø 185


**BOW75**

**BOW95**

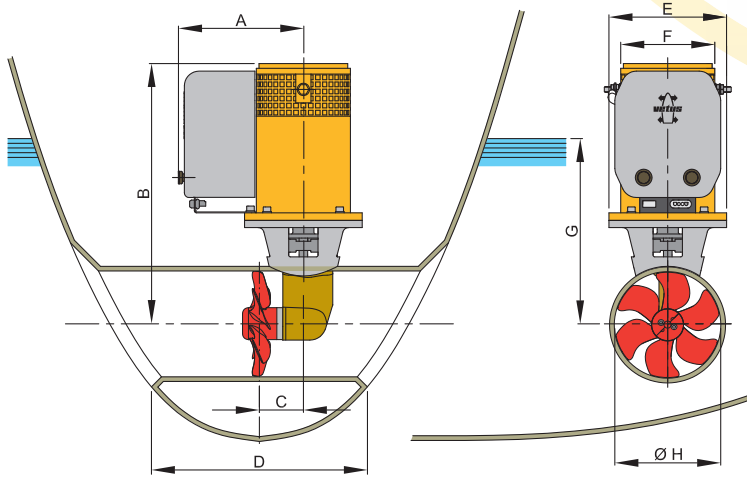
<b>Technical data:</b>	<b>BOW75</b>	<b>BOW95</b>	<b>BOW125</b>	<b>BOW160</b>
Motor	Reversible D.C. motor	Reversible D.C. motor	Reversible D.C. motor	Reversible D.C. motor
Power kW (hp) <b>Thrust, N (kgf)</b>	4,4 (6) <b>800 (80) - 12 V</b> <b>850 (85) - 24 V</b>	5,7 (8) <b>950 (95) - 12 V</b> <b>1050 (105) - 24 V</b>	5,7 (8) <b>1250 (125) - 12 V</b> <b>1400 (140) - 24 V</b>	7 (9,5) <b>1600 (160)</b>
Tunnel diameter, internal	185	185	250	250
Weight excluding tunnel, in kg	26	30	37	46
<b>Voltage, 12 Volt D.C.</b>				
Current consumption, Amps	500	610	800	
Operating time - continuously, in minutes	2	3	2,5	
- maximum per hour, in minutes	2	3	2,5	
Main fuse, "slow blow", Amps	335	425	500	
Batteries 12 Volt D.C., min. Ah / max. Ah	1x120 / 1x225	1x165 / 2x143	1x225 / 2x200	
Battery cables**, total length of positive and negative cables together, m / mm <sup>2</sup>	0 - 8 /70 8 - 11 /95	0 - 10 /95 10 - 12 /120	0 - 9 /120 9 - 12 /150	
Battery main switch: model BATSW, type	250	450	450	
<b>Voltage, 24 Volt D.C.</b>				
Current consumption, Amps	280	320	450	540
Operating time - continuously, in minutes	3	3,5	2,5	4,5
- maximum per hour, in minutes	3	3,5	2,5	4,5
Main fuse, "slow blow", Amps	200	200	300	355
Batteries 12 Volt D.C., min. Ah / max. Ah	2x108 / 2x143	2x108 / 2x143	2x108 / 2x165	2x165 / 4x165
Battery cables**, total length of positive and negative cables together, m/mm <sup>2</sup>	0-21 / 50	0-21 / 50	0-20 / 70	0-29 / 120
Battery main switch, model BATSW, type	250	250	250	600
** Based on VETUS Battery cable				



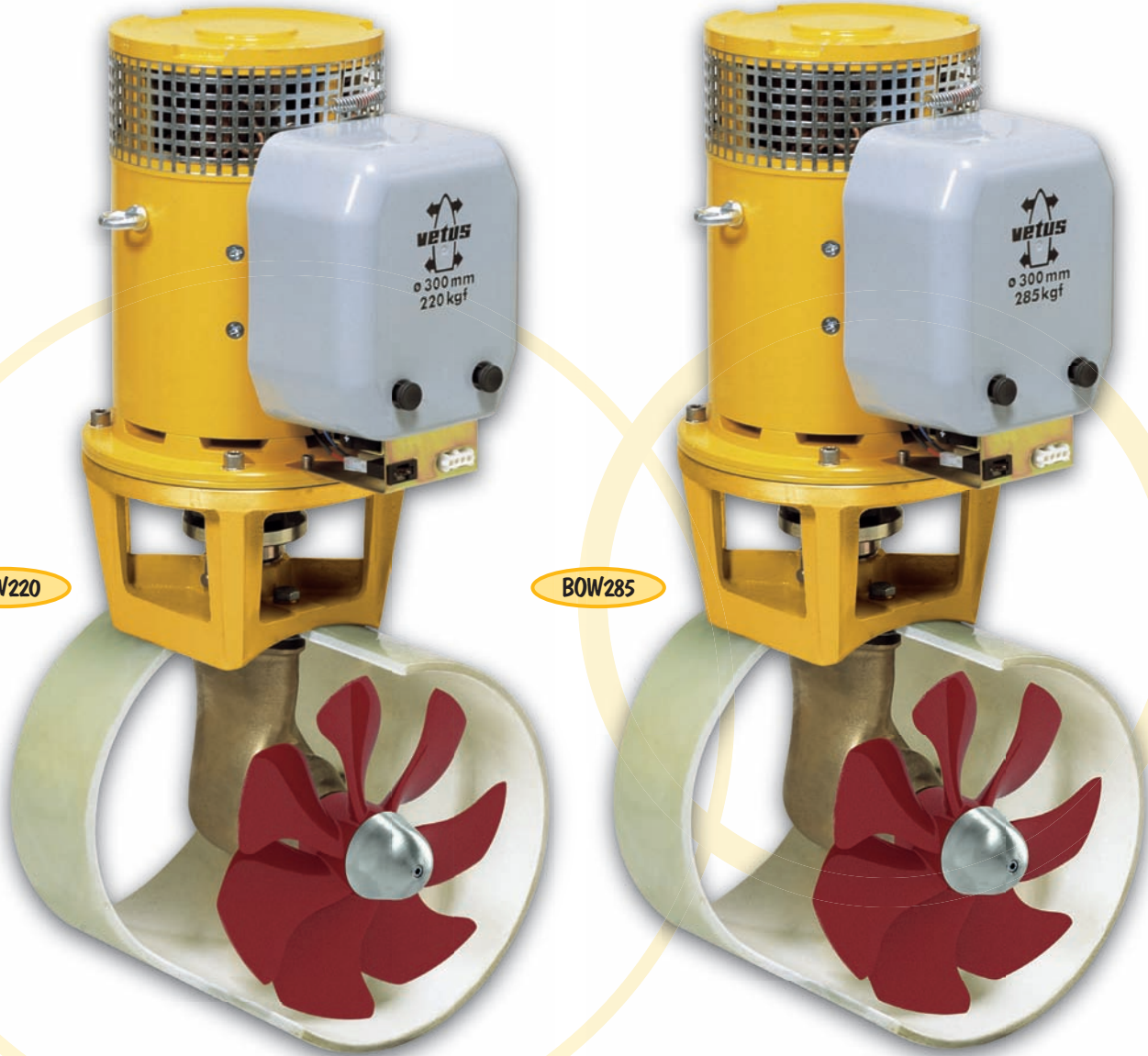
**BOW125**



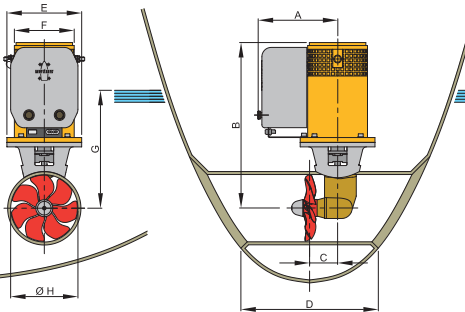
**BOW160**



Sizes in mm	BOW75	BOW95	BOW125	BOW160
A	155	209	209	222
B	435	443	500	548
C	77	77	108	108
D min./max.	370/740	370/740	500/1000	500/1000
E	200	200	200	240
F	Ø 135	Ø 150	Ø 150	Ø 185
G min.	185	185	250	250
H	Ø 185	Ø 185	Ø 250	Ø 250


**BOW220**
**BOW285**

The 48 Volt bow thruster comes complete with a series/parallel switch, for switching over from 24 Volt to 48 Volt D.C.

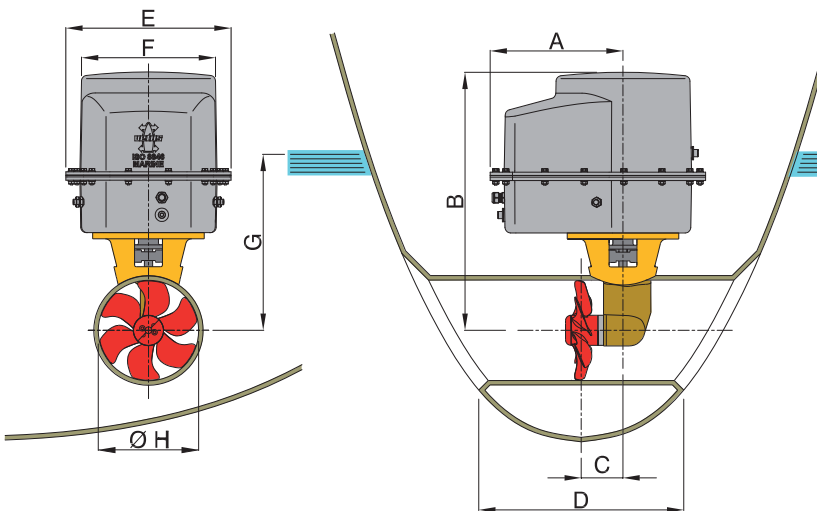


Sizes in mm	BOW220	BOW285
A	247	247
B	627	627
C	136	136
D min./max.	600/1200	600/1200
E	258	258
F	Ø 212	Ø 212
G min.	300	300
H	Ø 300	Ø 300

Technical data:	BOW220	BOW285
Motor	Reversible D.C. motor	Reversible D.C. motor
Power kW (hp)	11 (15)	16 (21,5)
<b>Thrust, N (kgf)</b>	<b>2200 (220)</b>	<b>2850 (285)</b>
Tunnel diameter, internal	300	300
Weight excluding tunnel, in kg	68	68
Voltage, 24 Volt D.C.		
Current consumption, Amps	760	
Operating time - continuously, in minutes	2,5	
- maximum per hour, in minutes	2,5	
Main fuse, "slow blow", Amps	500	
Batteries 12 Volt D.C., min. Ah / max. Ah	2x200 / 4x165	
Battery cables**, total length of positive and negative cables together, m/mm <sup>2</sup>	0-21 / 120	
Battery main switch: model BATSW, type	600	
Voltage, 48 Volt D.C.		
Current consumption, Amps		560
Operating time - continuously, in minutes		2,5
- maximum per hour, in minutes		2,5
Main fuse, "slow blow", Amps		355
Batteries 12 Volt D.C., min. Ah / max. Ah		4x143 / 8x120
Battery cables**, total length of positive and negative cables together, m/mm <sup>2</sup>		0-23 / 95
Battery main switch, model BATSW, type		600
** Based on VETUS battery cables		



Installing an electric bow or stern thruster in a petrol (gasoline) engine boat can be very dangerous, due to the possibility of the electric motor igniting fuel vapour. In order to eliminate the risk, this special housing will shield the bow or stern thruster from potentially explosive vapour. The housing enables the thruster to comply with the ISO 8846 Marine "ignition protection" standard. In addition to the standard thruster, the set consists of a watertight (IP65) housing for the electric motor and relays, together with all required seals, electrical connectors and fastening components. An automatic fuse for the control loom is also supplied. This can be reset externally without opening the housing.



These special "ignition protected" models are available with thrust powers of 55, 75, 95 or 125 kgf and for both 12 and 24 volt supply. They can also be used as stern thrusters, in combination with the appropriate kit.

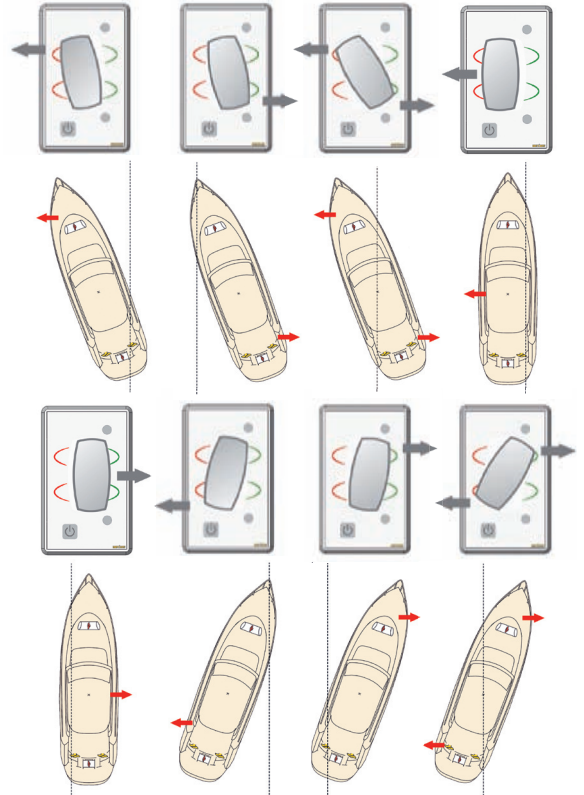
Because the motor housing is watertight, these sets are also ideal for use where the bow or stern thruster is installed in a wet or humid space.

Sizes in mm	BOW55	BOW75	BOW95	BOW125
A	195	238	238	238
B	412	460	460	517
C	79	77	77	108
D min./max.	300/600	370/740	370/740	500/1000
E	250	296	296	296
F	195	240	240	240
G min.	150	185	185	250
H	150	185	185	250



## EASY DOCKING PANEL

This control panel combines the functions of twin joysticks into one easy to operate knob. The simple and intuitive control action ensures that operation of both bow and stern thruster together becomes a smooth procedure. The use of Hall effect sensors in this control panel means there are no holes in it and it is therefore completely watertight. All safety features and other technical specifications are identical to the other control panels, shown.



**EZDOCK2** 85 x 138 mm



**BPSE2**  
85 x 85 mm



**BPJDE2**  
85 x 138 mm

Models BPJE2 and BPSE2 are suitable for either one bow thruster or one stern thruster. Model BPJDE2 is suitable for a combination of bow and stern thruster.



**BPJE2**  
85 x 85 mm

Control panels type BPSE2, BPJE2, BPJDE2 and EZDOCK2 have identical functions to those on the adjacent page, but in addition feature:

- Built-in **time lapse** device when reversing the direction of rotation.
- Automatic switch off after 30 minutes inactivity. This feature is user selectable during installation
- In the event of continuous running for more than 2 minutes there is a **warning** LED and buzzer and the thruster will switch off automatically. The panel will reset itself after 5 seconds.

**ANY CONTROL PANEL CAN FITTED AT ANY HELM POSITION AND THEY ARE EASILY INTERCONNECTED**

## CONTROL PANELS FOR ELECTRIC BOW AND STERN THRUSTERS



### BPA

Installation of panels BPSE2, BPJE2, BPSSE or BPJSE in place of an older style BPS or BPJ panel is possible using an adapter plate, available upon request.

### EZDOCKS



### BPJDSE

85 x 138 mm

### BPSSE

85 x 85 mm

### BPJSE

85 x 85 mm

Control panels type BPSSE, BPJSE, BPJDSE and EZDOCKS have the following features:

- Protected against accidental or unauthorized operation.
- Panel power on indicator.
- **Warning** LED and buzzer in the event of continuous running for more than 2 minutes
- Control circuit overload protection.
- **Watertight** to IP 65.

**ANY CONTROL PANEL CAN FITTED AT ANY HELM POSITION AND THEY ARE EASILY INTERCONNECTED**



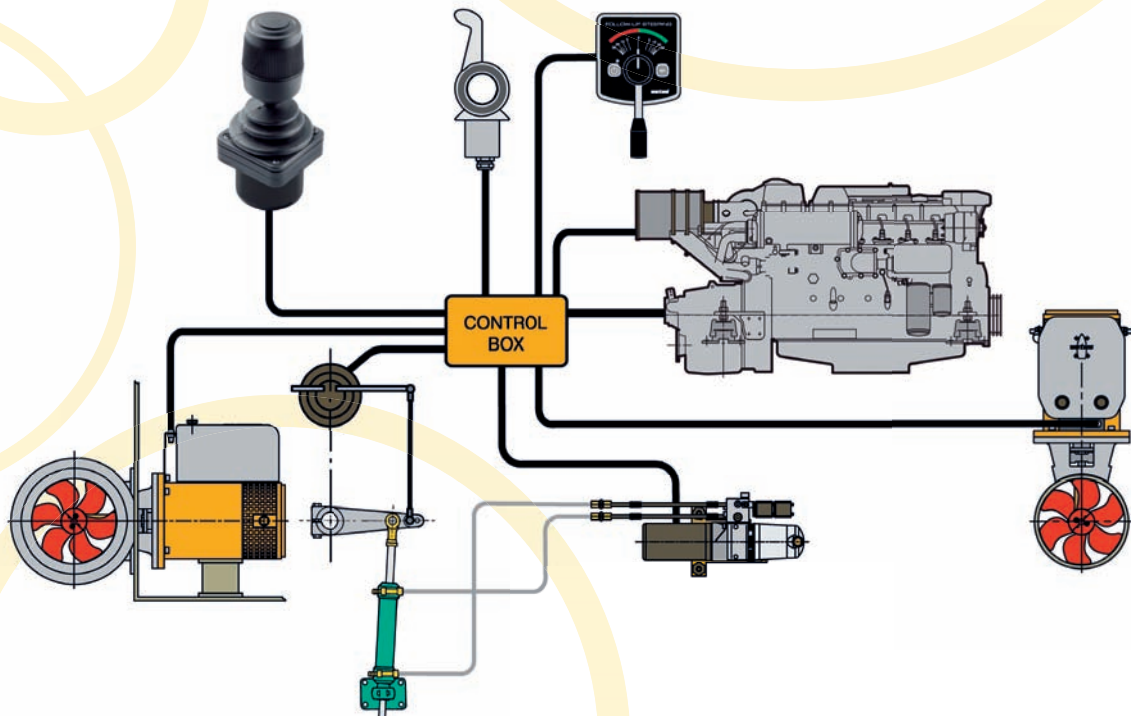
The new Pro-Docker from VETUS brings computer control to the helmsman's fingertips and makes manoeuvring your boat not only simple, but enjoyable too.

The Pro-Docker **simultaneously** controls the propulsion engine(s), the bow thruster and the stern thruster if fitted. Intuitive operation of just a single joy stick is all that is needed to perform the most accurate boat movements. This makes even the tightest berthing manoeuvre not only a pleasure but a source of pride. The VETUS Pro-Docker is the perfect assistant, allowing you to handle your boat like a true professional.

**TECHNICAL SPECIFICATION**

- Suitable for 24 Volt electric bow and stern thrusters.
- Suitable for 12 and 24 Volt engine electrical systems.
- Analogous propulsion engine control.
  - Control actuators
  - Voltage controlled 0 - 5 V
  - Current controlled 4 - 20 mA
 Digital engine control effected through J1939 CAN-BUS
- Suitable for mechanical and hydraulic gearboxes. (However, the "trolling" function cannot be used if fitted).
- Fulfils all CE and ABYC directives
- Dimensions Joystick: 48 x 48 x 75 mm (lwxh)
- Dimensions Control box: 300 x 300 x 130 mm

PDJS



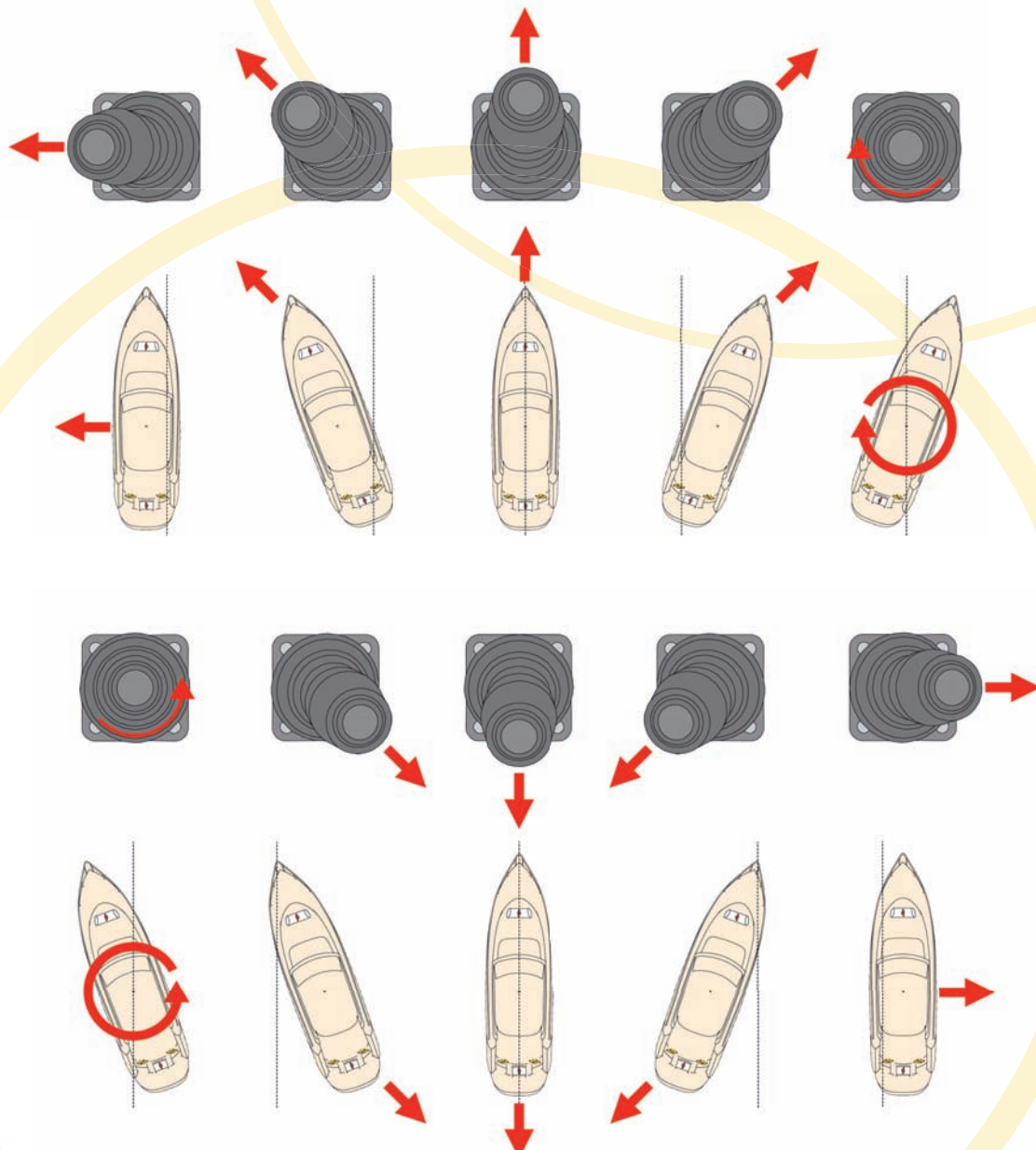
The Pro-Docker operates the bow and stern thrusters, together with the propulsion engines' throttles and gearshifts, with the aid of just one joystick. As an option, it can also be interfaced with the VETUS follow-up steering system, so that the rudders can be operated too.

Intuitive operation of the joystick allows **proportional** control of the bow and stern thrusters; from very slow up to full thrust, by gradually **moving the joystick to port or starboard**. By **rotating** the joystick, clockwise or anti-clockwise, the boat will rotate in the appropriate direction. The engines are controlled by **moving the joystick forwards or backwards**. Any combination of the joystick movement is possible to give you full and precise control.

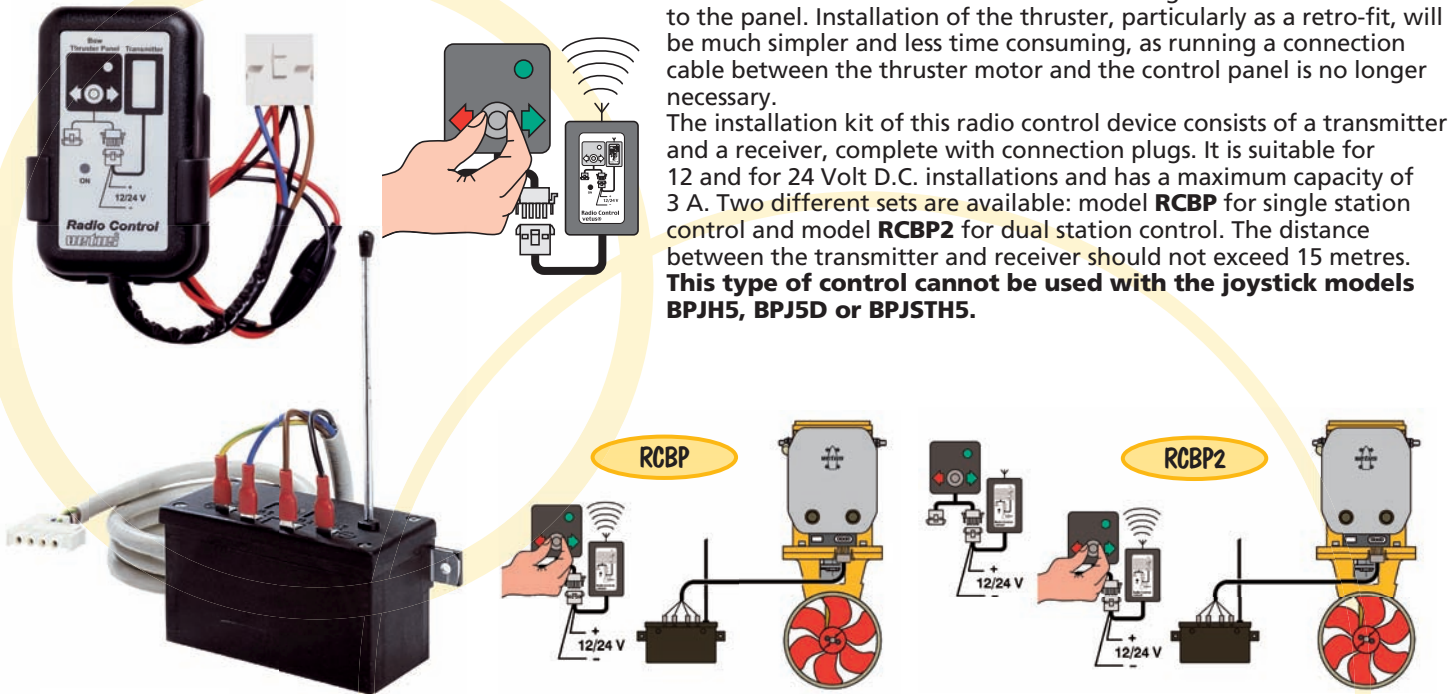
## JOYSTICK POSITIONS

The various joystick positions and the effect on the boat are shown below.

A memory button is also provided on the top of the joystick. During a manoeuvre this button can be pressed and the joystick released. The system will follow the chosen command until the button is pressed again, thus making short handed berthing simplicity itself. Hall-effect sensors in the joystick ensure minimal mechanical components and the highest levels of reliability and longevity.



## WIRELESS CONTROL PANEL



With the aid of this radio connection a bow thruster (or a stern thruster) may be controlled using one of the VETUS control panels, without the need to install an interconnecting cable from the thruster to the panel. Installation of the thruster, particularly as a retro-fit, will be much simpler and less time consuming, as running a connection cable between the thruster motor and the control panel is no longer necessary.

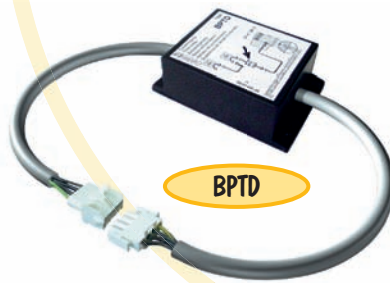
The installation kit of this radio control device consists of a transmitter and a receiver, complete with connection plugs. It is suitable for 12 and for 24 Volt D.C. installations and has a maximum capacity of 3 A. Two different sets are available: model **RCBP** for single station control and model **RCBP2** for dual station control. The distance between the transmitter and receiver should not exceed 15 metres. **This type of control cannot be used with the joystick models BPJH5, BPJ5D or BPJ5TH5.**



**BPJSTA**

Joystick switch only for dashboard mounting. **Watertight to IP 65.**

## TIME LAPSE DEVICE



**BPTD**

Only necessary for BPJSTA, BPSM, AFSTFR and AFSTFG. Eliminates the risk of the bow thruster being switched over too quickly. Highly recommended for hire craft to prevent motor damage.

## RADIO REMOTE CONTROL



**REMCO**

This radio control may be used for remote operation of VETUS bow and/or stern thrusters and anchor windlasses. Two models are available.

Bow thruster tunnels, nominal dimensions		
	internal diameter	external diameter
glassfibre reinforced polyester:	110 mm	120 mm
steel :	112,5 mm	121 mm
aluminium :	112 mm	120 mm
glassfibre reinforced polyester:	150 mm	160,6 mm
steel :	150 mm	159 mm
aluminium :	150 mm	160 mm
glassfibre reinforced polyester:	185 mm	195,6 mm
steel :	182,5 mm	193,7 mm
aluminium :	185 mm	196 mm
glassfibre reinforced polyester:	250,6 mm	264,6 mm
steel :	252,8 mm	267 mm
aluminium :	250 mm	264 mm
glassfibre reinforced polyester:	300 mm	320 mm
steel :	303 mm	318 mm
aluminium :	300 mm	320 mm
glassfibre reinforced polyester:	400 mm	424 mm
steel :	397 mm	419 mm

Both the internal and the external diameters may vary slightly from the given dimensions.

## TUNNELS FOR BOW THRUSTERS

Tunnels are available in glassfibre, steel and aluminium. Available in standard lengths or per metre, see pricelist.



**PANEL CONNECTION CABLES**

Panel connection cables with multi-plugs fitted are available in different lengths (see price-list).

**BP29**



**BOW THRUSTER CONTROL PANEL FOR SIDE MOUNTING**



With on/off switch and rocker switch.  
Diameter: 102 mm  
Build-in depth: 79 mm  
**Watertight to IP 65.**

**BPSM**

**REMOTELY CONTROLLED BATTERY MAIN SWITCH AND EMERGENCY STOP**

Modern electrical installations are intrinsically very reliable. However a remotely operated battery switch is now required by law in many countries. This VETUS battery main switch can be either remotely controlled electrically or activated by hand in an emergency. This makes it ideal for use with bow thrusters, anchor windlasses or other high current consumers. The switch should be fitted as close as possible to the battery of the bow thruster or other consumer, but always in a position where the red emergency stop button is within easy reach. For remote switching on and off, a control panel is supplied. The standard loom is pre-wired with multi-plugs. Extension looms are available as an option. In an emergency or if the remote control is inoperable, the battery bank can be isolated by pressing the red button. This battery main switch/emergency stop is available in combination with 12 or 24 Volt D.C.

**Attention:** In the case of a 24 Volt bow thruster, connected to a 12 Volt board circuit by means of a series/parallel switch, a 12 Volt battery main switch must be selected. And in the case of a 48 Volt bow thruster, connected to a 24 Volt board circuit by means of a series/parallel switch, a 24 Volt main switch must be used. Maximum loads: 250 A continuously, 800 A at 3 minutes, intermittently.

**BPMAIN**



These foot-switches may be used instead of, or in addition to any of the control panels. (Ideally suited for installation on sailing boats). Watertight to IP 65.

**AFSTFR**

**AFSTFG**



The foot switches have a protective cover, to avoid accidental engaging of the solenoids. Available with red or grey covers.

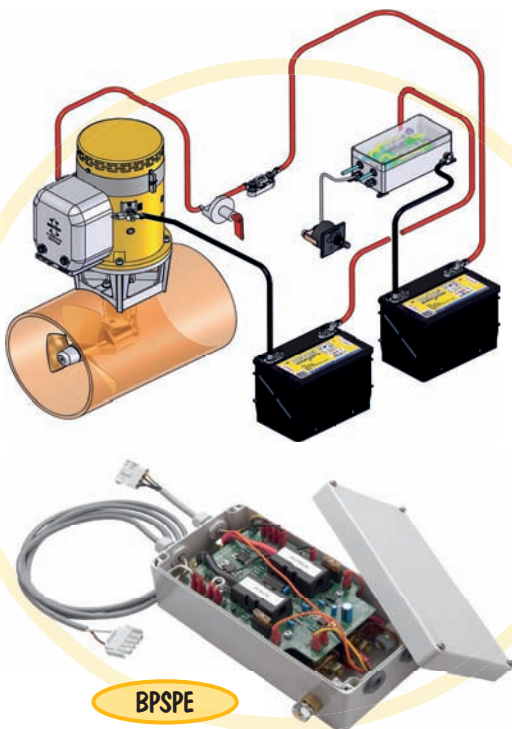
**SERIES/PARALLEL SWITCH**

The 160 kgf and 220 kgf bow thrusters are only available with a 24 Volt DC electric motor. By installing a series/parallel switch in a 12 volt main power supply system it is possible that:

- The 24 Volt bow thruster will work using 12 Volt batteries connected in series, so as to obtain the required 24 volt voltage.
- For charging, the 12 Volt batteries are automatically connected in parallel and linked to the 12 Volt charging system.

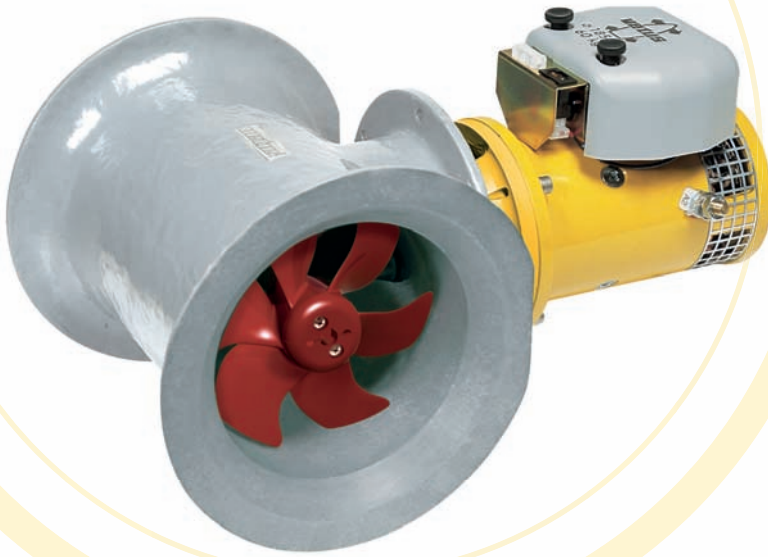
This series/parallel switch comes complete with pre-assembled auxiliary relays to ensure easy connection between the battery bank and the bow thruster. When the batteries installed for the bow thruster are also used for other 12 Volt consumers, it should be remembered that the current is supplied via the charging contacts of the series/parallel switch. These contacts have a continuous duty rating of 100 Amps, and an intermittent 20% rating of 150 Amps. As a consequence, never use these batteries as starter batteries and never connect an anchor windlass to them. The series/parallel switch functions completely automatically and therefore the operation of the bow thruster is as usual.

The 285 kgf – 48 Volt DC bow thruster has a series/parallel switch supplied as standard, to permit connection to a 24 Volt battery bank. This 48 Volt series/parallel switch is also available separately (code: BP3008).



**BPSPE**

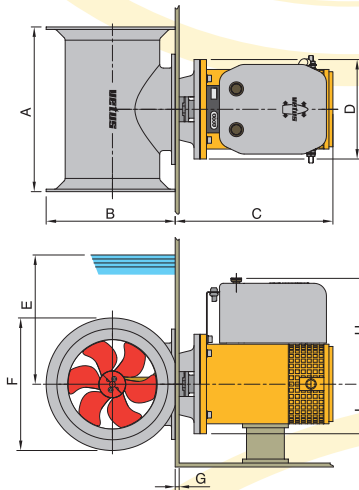
## STERN THRUSTERS (FOR TRANSOM MOUNTING)



A VETUS stern thruster, in combination with a VETUS bow thruster will provide even greater manoeuvrability of your boat in locks or harbours. The availability of a side-directional thruster in the bow and another side-directional thruster at the transom makes mooring, sailing away and finding the right spot in the lock or the marina child's play. The effects of wind and current can be effectively countered, except in extreme situations. Installation of a VETUS stern thruster is a simple operation. The electric motor and the other electric components are fitted internally to the transom of the boat. The tunnel and the propeller are installed externally on the transom.

A range of six different stern thruster kits is available, with tunnel diameters of 110, 150, 185, 250, 300 or 400 mm. For technical details of the matching bow thruster units, please see pages 8, 9, 10 and 11.

**THE MATCHING BOW THRUSTER UNIT IS TO BE ORDERED SEPARATELY.**



**STERN110P**

**STERN150P**

**STERN185P**

**STERN250P**

**STERN300P**

**STERN400P**

A **stern thruster installation kit** comprises a tunnel with ideally shaped end fairings to ensure optimum performance. The mounting flange is integral and the whole assembly is manufactured in strong and maintenance free GRP.

	STERN110	STERN150				STERN185				STERN250			STERN300				STERN400	
	Combined with																	
Sizes in mm	BOW 25	BOW 35	BOW 55	BOW 55 hydr.	BOW 60	BOW 75	BOW 95	BOW 95 hydr.	BOW 125	BOW 160	BOW 160 hydr.	BOW 220	BOW 230 hydr.	BOW 285	BOW 310 hydr.	BOW 410 hydr.	BOW 550 hydr.	
A	230	270	270	270	300	300	300	300	460	460	460	540	540	540	540	740	740	
B	155	215	215	215	268	268	268	268	360	360	360	437	437	437	437	543	543	
C	232	219	282	163	267	305	313	151	313	373	168	416	242	416	242	0	0	
D	149	149	160	160	160	200	200	200	200	240	240	258	258	258	258	0	0	
E min.	110	150	150	150	185	185	185	185	250	250	250	300	300	300	300	400	400	
F	Ø 180	Ø 240	Ø 240	Ø 240	Ø 275	Ø 275	Ø 275	Ø 275	Ø 370	Ø 370	Ø 370	Ø 450	Ø 450	Ø 450	Ø 450	Ø 550	Ø 550	
G max.	25	19	47	47	33	26	26	26	58	92	92	50	50	50	50	unlimited	unlimited	
H	138	138	143	80	143	155	209	100	209	222	120	237	129	237	129	0	0	
I	87	117	117	117	111	111	111	111	111	154	154	172	172	172	172	200	200	

## EXTENSION KIT FOR STERN THRUSTERS



or 300 mm. This kit consists of two shells made of GRP, together with all the necessary stainless steel fastenings. The kit can be easily retrofitted to existing installations.

This extension kit should be used if the transom is fitted with other equipment, which may prevent unhindered water flow through the tunnel. It is also ideal for so-called "house boats", which in general have a very shallow draft both at the bow and at the stern.

For the stern thruster to function correctly, it is important that the propeller is submerged well below the waterline. If this is not the case, the propeller may suck air into the tunnel, with a considerable loss of thrust power as a consequence. However, on some boats this is not really feasible, because the draft at the stern is too shallow and because the thruster assembly should never protrude beneath the bottom of the boat.

In order to ensure both tunnel openings are sufficiently below the waterline, VETUS has developed an extension kit for stern thrusters with tunnel diameters of Ø 150, 185, 250

In order to operate VETUS bow or stern thrusters, a variety of remote control panels are available (see page 14 and 15).

All panels are **watertight**, according to IP 65. Connection cables (page 18 and 19) must be ordered separately.



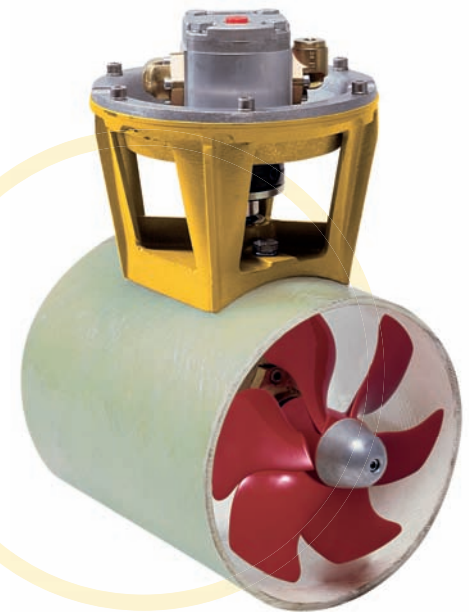
There are seven models of hydraulic bow thrusters in the VETUS sales programme, featuring as standard a hydraulic motor.

This hydraulic motor is driven by a hydraulic pump (see page 25). If a hydraulic pump and associated tank are already installed on board, then, in most cases, this assembly can be used for driving the bow thruster too.

Some marine engine manufacturers, e.g. VETUS DEUTZ, supply as standard a special P.T.O. (Power Take Off) connection, which greatly simplifies the installation of the hydraulic pump. In addition to the pump and the hydraulic storage tank, VETUS can also supply the required load sensing and control devices, as well as the high-pressure hydraulic hoses, complete with end fittings.

For the 160 kgf thruster, use kit type STERN 250P.  
 For the 230 kgf and 310 kgf thruster, use kit type STERN 300P.  
 For the 410 & 550 kgf thrusters, use kit type STERN 400P.

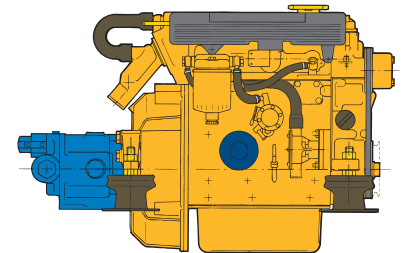
The three most powerful VETUS hydraulic bow thrusters can also be driven in a safe and efficient manner, using a specially prepared diesel engine, instead of a pump on the main engine. Please see the VETUS powerpacks on page 129. In this case, the matching hydraulic pump will be supplied as part of the powerpack. Installing a powerpack on board can considerably reduce the required generator set capacity, by operating hydraulic functions which are normally electrically powered.



All these hydraulic bow thrusters may be fitted to GRP steel or aluminium tunnels or used as a stern thruster using the appropriate installation kit.

For the 55 kgf thruster, use kit type STERN 150P.  
 For the 95 kgf thruster, use kit type STERN 185P.

A VETUS powerpack type PM 415 of 24.3 kW (33 hp) is suitable to drive a VETUS bow thruster of 310 kgf. The 410 kgf bow thruster can be powered with the VETUS powerpack type PM 417 of 30.9 kW (42 hp) and the 550 kgf model requires the VETUS powerpack type PVH 465 of 48 kW (65 hp). Please see page 129.



## CONTROL PANELS FOR HYDRAULIC BOW AND STERN THRUSTERS

Hydraulic bow thruster panel with on/off switch and two step joystick for operation at half power or full power.  
**Watertight** to IP 65.



**BPJ5** 85 x 85 mm

Hydraulic bow and stern thruster panel with on/off switch and twin two step joysticks for operation at full or half power.  
**Watertight** to IP 65.



**BPJ5D** 85 x 136 mm

Hydraulic bow thruster two step joystick for operation at half power (no panel).  
**Watertight** to IP 65.



**BPJSTH5**



For accessories, see page 18 and 19.

**NOTE: If non-VETUS hydraulic components are used, we cannot accept responsibility for the correct functioning of the total assembly.**

**VETUS will be pleased to supply all accessories required for correct bow thruster installation. Models with an output of 410 kgf or 550 kgf are available on special request.**



**Hydraulic pump,** see page 25.



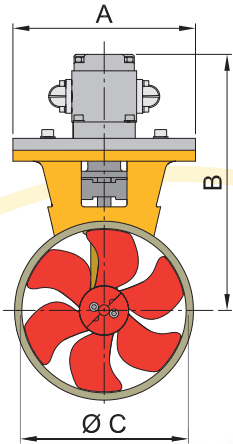
**Hydraulic storage tank,** see page 26.



**Control unit,** see page 27.

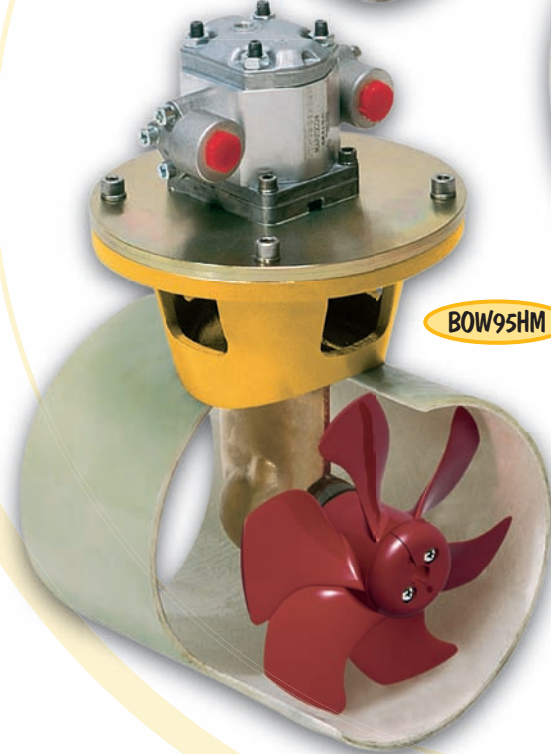
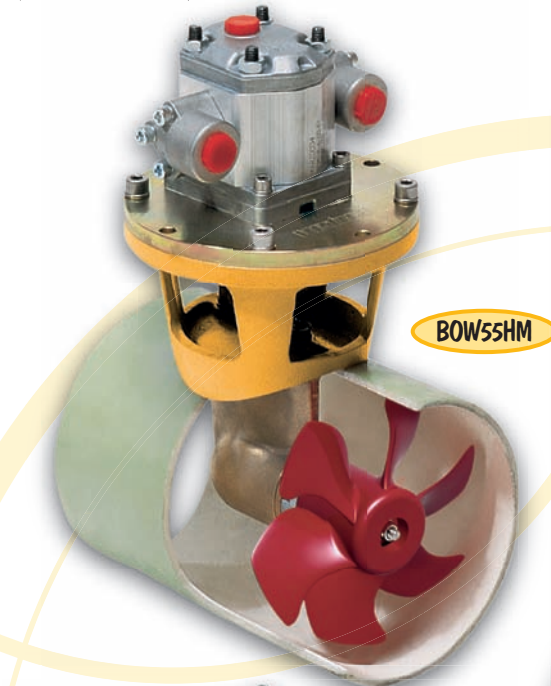


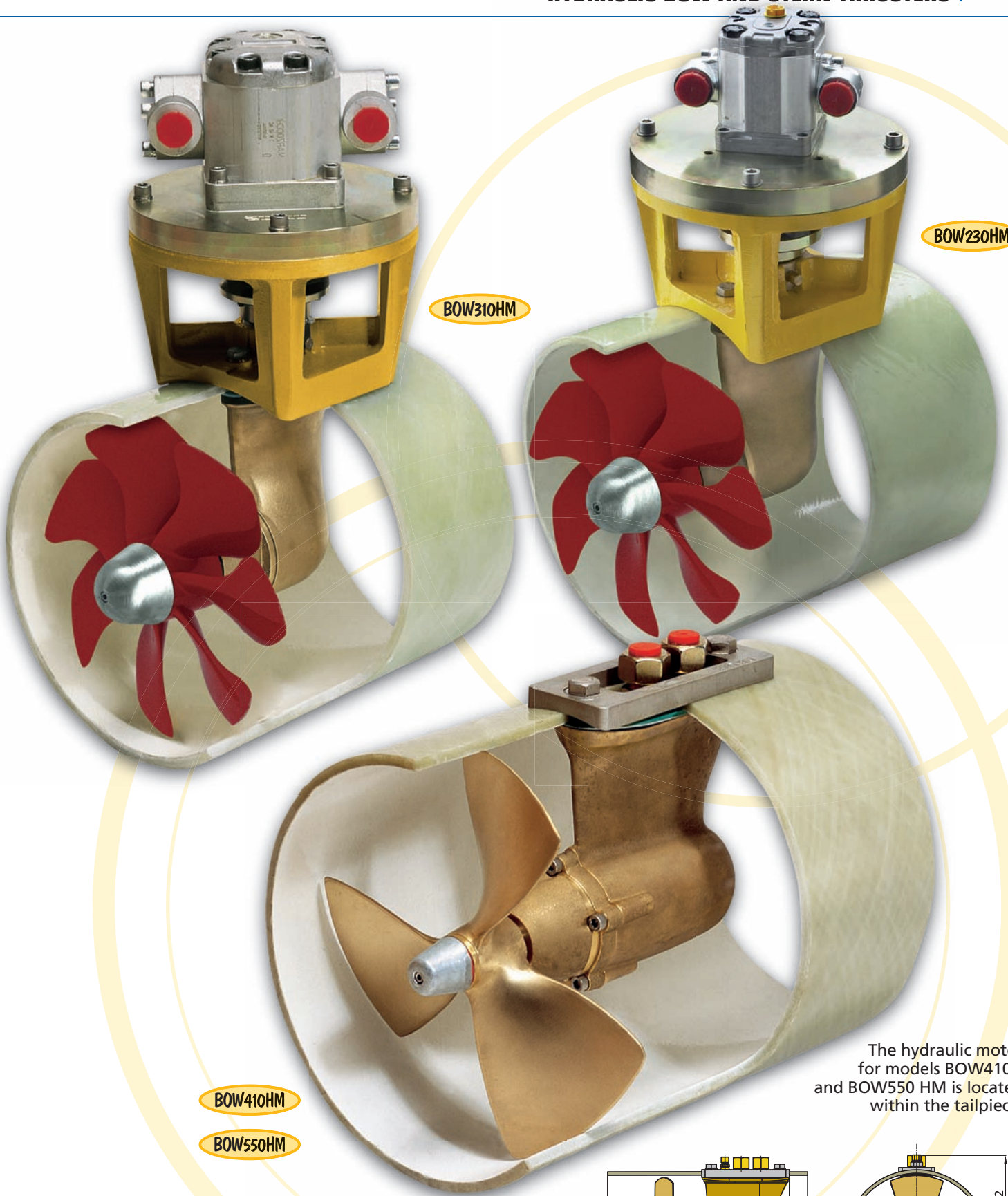
**Hydraulic hoses complete with fittings,** see page 27.



**Technical data:**

Sizes in mm	BOW55HM	BOW95HM	BOW160HM	BOW230HM	BOW310HM
A	Ø 160	Ø 200	Ø 240	Ø 258	Ø 258
B	258	276	345	431	455
C	Ø 150	Ø 185	Ø 250	Ø 300	Ø 300
Hydraulic motor power, kW	3,5	6,0	9,5	12,5	20
Hydraulic motor speed, rpm	3000	4100	3300	1900	2000
Hydraulic motor capacity, cm <sup>3</sup> /rev	4,2	4,2	7,0	16,8	27
Flow rate, l/min	13	18	24	33,5	57
Operating pressure, bar	165	230	250	230	220
Internal tunnel diameter, mm	150	185	250	300	300





**BOW310HM**

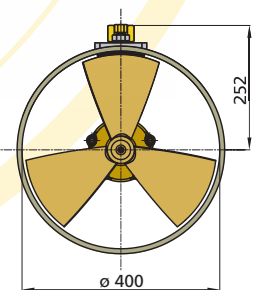
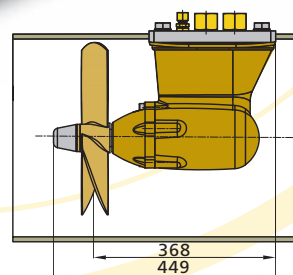
**BOW230HM**

**BOW410HM**

**BOW550HM**

The hydraulic motor for models BOW410H and BOW550 HM is located within the tailpiece.

<b>Technical data:</b>	<b>BOW410HM</b>	<b>BOW550HM</b>
Hydraulic motor power, kW	22	33
Hydraulic motor speed, rpm	1920	1920
Hydraulic motor capacity, cm <sup>3</sup> /rev	45	45
Flow rate, l/min	92	92
Operating pressure, bar	180	280
Internal tunnel diameter, mm	400	400





Modern boats have such a tremendous amount of equipment on board, that it is hard for us to imagine how our ancestors mastered the turbulent seas. Take as an example the enormous tiller that vessels used to hold a steady course. That was really hard work! This type of rudder control was the true predecessor of our current "joystick". Luckily, modern hydraulics permit us to steer with just one finger if we wish.

Today, the bow thruster, anchor windlass, stabilisers and even the propeller shaft propulsion make good use of hydraulic equipment. Of course, it is of utmost importance that such equipment can be relied on one hundred per cent. Therefore, VETUS has developed a complete range of hydraulic pumps, together with tanks and fittings, as well as modular control units, which offer top quality systems at an economical price.



## We've got the power

A basic hydraulic system consists of following components:

- A hydraulic pump which is driven by the propulsion engine, by a generator set or by its own auxiliary engine, such as the VETUS Power Pack (see page 129)
- A hydraulic motor, connected to the equipment to be powered.
- A special tank for storing and cooling the hydraulic fluid; all relevant control units are fitted onto the top of the tank for convenience.
- High pressure hoses, which interconnect the individual components.

VETUS has carefully selected the capacities of the various hydraulic components, so that only one tank and one pump are necessary to operate various pieces of equipment independently from each another.

Important: If the propulsion engine is used to drive the pump, it must have sufficient power at idling speed. This will allow the hydraulic functions to operate without increasing the engine r.p.m. If it is seldom required to use the engine for propulsion and operate a hydraulic function simultaneously, a relatively small propulsion engine can be installed. In this case, the throttle can be used to give additional hydraulic power. However, the best option in such cases is the installation of a VETUS Power Pack to drive the hydraulic pump. You will then have full control of an independent system, enabling you to run the air conditioning, charge the batteries and heat the water, even at slower speeds. This also means that a smaller generator set will usually be sufficient.

### Power Hydraulica



# HYDRAULIC PUMPS FOR INSTALLATION ON PROPULSION OR AUXILIARY ENGINES

All VETUS hydraulic drive systems feature a variable and adjustable piston pump, which operates according to the constant pressure principle. This type of pump continuously varies its output to provide the ideal balance between the required flow rate and the maximum operating pressure ("load sensing"). If no hydraulic flow is required, the pump will simply freewheel, in which case the power drain and wear and tear will be negligible.

## STANDARD PUMPS (WITH ALUMINIUM BODY)

### HT 1015

Capacity : 45 cc  
Sense of rotation : Left handed.  
Connection : SAE-B flange,  
13 spline shaft.  
Rear connection for  
suction and pressure. Fits  
VETUS DEUTZ engines  
and PRM gearboxes.

Maximum r.p.m. : 3.000.

### HT 1016

Capacity : 45 cc  
Sense of rotation : Left handed.  
Connection : SAE-B flange,  
13 spline shaft.  
Side connection for  
suction and pressure.  
Fits PRM gearboxes.

Maximum r.p.m. : 3.000.

### HT 1017

Capacity : 45 cc  
Sense of rotation : Right handed.  
Connection : SAE-B flange,  
13 spline shaft.  
Side connection for  
suction and pressure.  
Fits Twindisc  
gearboxes.

Maximum r.p.m. : 3.000.

For John Deere engines, pump model HT1027 has an extension shaft, for connection to the water pump. All other specifications are the same as pump model HT1017.

### HT 1022

Capacity : 69 cc  
Sense of rotation : Left handed.  
Connection : SAE-C flange,  
1 1/4 parallel shaft.  
Side connection for  
suction and pressure.  
Fits Twindisc  
gearboxes.

Maximum r.p.m. : 2.500.

## LOW NOISE PUMPS (WITH CAST IRON BODY)

### HT 1015SD2

Capacity : 45 cc  
Sense of rotation : Left handed.  
Connection : SAE-B flange,  
13 spline shaft.  
Rear connection for  
suction and pressure. Fits  
VETUS DEUTZ engines  
and PRM gearboxes.

Maximum r.p.m. : 2.800.

### HT 1016SD1

Capacity : 30 or 45 cc  
Sense of rotation : Left handed.  
Connection : SAE-B flange,  
13 spline shaft.  
Side connection for  
suction and pressure.  
Fits PRM gearboxes.

Maximum r.p.m. : 3.600 SD1.  
2.800 SD2.

### HT 1016SD2

### HT 1017SD1

Capacity : 30 or 45 cc  
Sense of rotation : Right handed.  
Connection : SAE-B flange,  
13 spline shaft.  
Side connection for  
suction and pressure.  
Fits Twindisc  
gearboxes.

Maximum r.p.m. : 3.600 SD1.  
2.800 SD2.

### HT 1017SD2

### HT 1022SD

Capacity : 75 cc  
Sense of rotation : Left handed.  
Connection : SAE-C flange,  
14 spline shaft.  
Side connection for  
suction and pressure.  
Fits Twindisc  
gearboxes.

Maximum r.p.m. : 2.880.

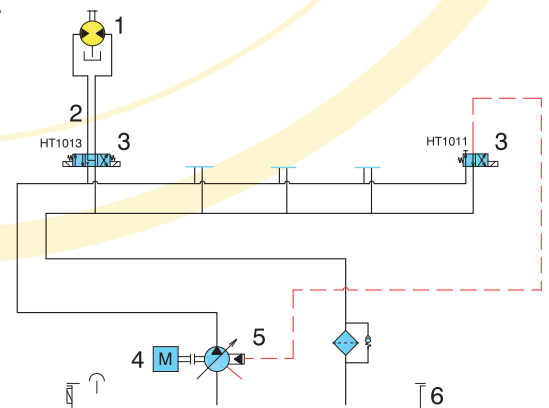
## WHICH PUMP IS REQUIRED FOR MY ENGINE?

In order to determine this, the manufacturer's specification for the engine must be consulted. If the engine or the gearbox is provided with a Power Take Off (P.T.O.), the smaller hydraulic pumps may be connected directly to it via the SAE - B flange. If no P.T.O. is available, please consult Vetus. Pump models HT1015 to HT1017 all have a SAE -B flange with different rotation and hose connection possibilities. Model HT1022 has a SAE-C flange and is designed for belt drive with a bearing block. We can supply the required supports. One pump can be used to power various hydraulic devices on board.

## DIAGRAM OF A SINGLE HYDRAULIC DRIVE

It is possible to connect various equipment devices to one hydraulic pump.

1. Hydraulic motor
2. High pressure pump
3. Solenoid control valve
4. Propulsion engine
5. Hydraulic pump
6. Storage tank hydraulic fluid



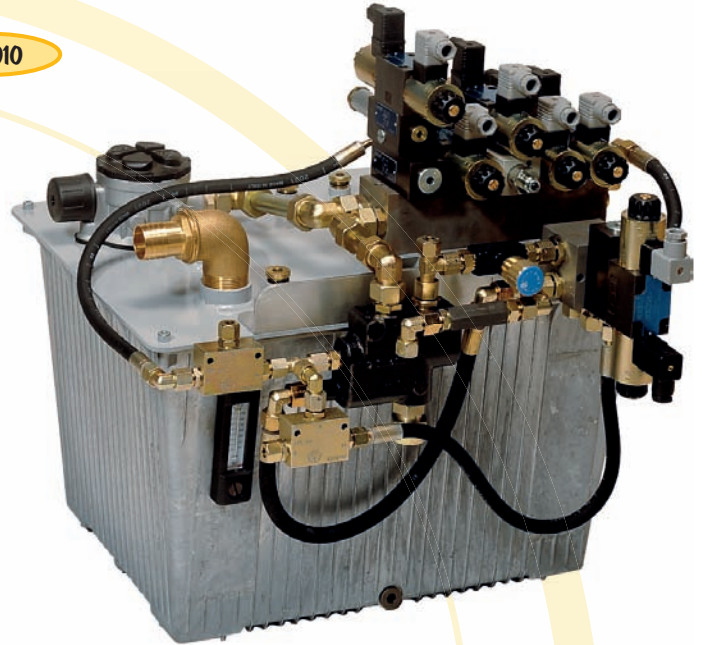
Hydraulic systems require the installation of a hydraulic tank, as a reservoir for storage of the hydraulic fluid on board. This tank serves as a buffer tank for the hydraulic fluid, and at the same time, cools the fluid which has become heated during use. The lid of this hydraulic tank serves as the base plate for all control units required to operate the various hydraulic devices. VETUS supplies this hydraulic tank ready to use and with complete installation of all control units, as ordered. Additional control units can be supplied as separate components, if and when required.

### EXAMPLES OF VETUS ALUMINIUM HYDRAULIC TANKS

The dimensions of the bare tank (without control units) are: 61.5 cm (L) x 47.5 cm (W) x 36 cm (H). Tank content 70 litres.



A hydraulic tank for one pump and one hydraulic device.



A hydraulic tank for one pump and four hydraulic devices.

### EXAMPLES OF VETUS STAINLESS STEEL HYDRAULIC TANKS

The dimensions of the bare tank (without control units) are: 70 cm (L) x 41 cm (W) x 46 cm (H). Tank content 130 litres.



Hydraulic tank for one pump and four hydraulic devices plus hydraulic power steering.

## HYDRAULIC LOAD SENSING AND CONTROL DEVICES (FOR INSTALLATION ON TOP OF THE HYDRAULIC TANK)

In order to direct the oil flow from the hydraulic pump to the equipment to be driven, load sensing and control devices, which are built up in modular construction segments, are used. These ensure the correct speed and sense of rotation of the equipment to be driven. Available for 24 Volt electric installations, 12 Volt on request.



**HT 1011**

Single step load sensing device. Gives zero or full flow rate, depending on whether a load is sensed or not. Used for e.g. bow and stern thrusters.



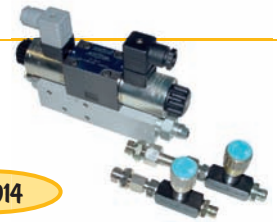
**HT 1012**

Dual step load sensing device. Gives zero, partial or full flow rate, dependant on load sensed. Used for e.g. bow and stern thrusters.



**HT 1013**

Solenoid control unit (24 Volt) for bow and stern thrusters.



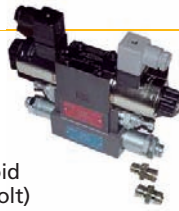
**HT 1014**

Solenoid control unit (24 Volt) with counterbalance, for e.g. mast lowering, hinged radar support (or any other hydraulic cylinder for numerous applications).



**HT 1019**

Solenoid control unit (24 Volt) for use with a hydraulically powered steering system or an automatic pilot.



**HT 102311**

Single step solenoid control unit (24 Volt) for use with anchor windlasses.



**HT 1024**

Solenoid control unit (24 Volt) for use with a set of stabilisers.



**HT 1026**

An extension of the basic block necessary if more than 5 solenoid control devices are required.

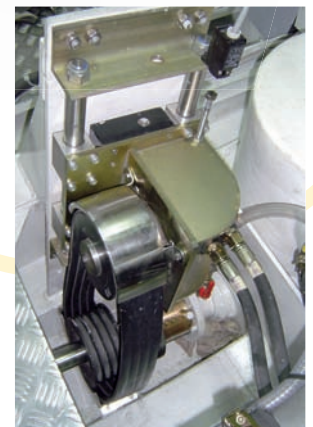
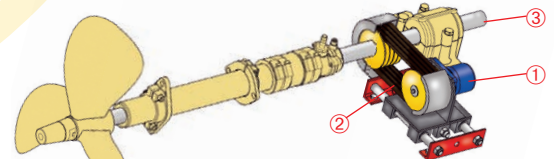
## DIESEL-HYDRAULIC PROPULSION SYSTEM

The VETUS diesel-hydraulic propulsion system consists of a hydraulic motor, which is capable of producing high radial output power, that is to say, rotating slowly but with a high torque. The required power to drive the hydraulic motor can be provided by a "Powerpack" (an engine with a hydraulic pump attached, see page 25) or by a generator set with an integrated hydraulic pump (see page 129). The hydraulic oil flow is regulated proportionally, which means that the propeller shaft can start turning extremely slowly and that speed is built up gradually.

This hydraulic motor ① drives the propeller shaft ③ by means of a "Power Band" ②. In this case the power band consists of 4 V-belts, vulcanized to a flat belt, forming a complete band. The hydraulic motor is mounted on a frame that can be moved on a rail, by means of a hydraulic cylinder. When not in use, the power band will be slack and hang loosely over

the propeller shaft pulley under its protective cover. When the hydraulic cylinder is activated, the power band is tensioned around both pulleys, thus creating mechanical transmission between the hydraulic motor and the propeller shaft.

The VETUS diesel-hydraulic propulsion system can be used to propel the boat at very low speeds on inland waterways where wash is detrimental to the environment or when low trolling speeds are required. Of course, it can also be used as an emergency propulsion system, in case of main engine trouble. The propulsion system may only be used with propeller shafts that have a separate thrust bearing.



We recommend the use of the following hydraulic fluids: HLP, ISO-VG46.

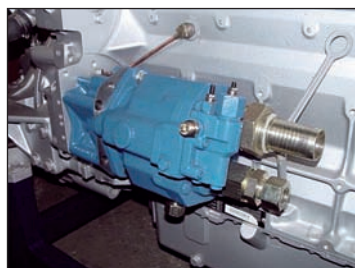
**VHT1**

**VHT4**

**VHT20**



All VETUS DEUTZ engines have a P.T.O. connection for a hydraulic pump as standard. If other engine makes do not provide such a device, please consult VETUS.



## HYDRAULIC HOSE

Hose for hydraulic drives, complete with connector nipples fitted. This type of hose is available in various lengths and diameters to order.



**HH**

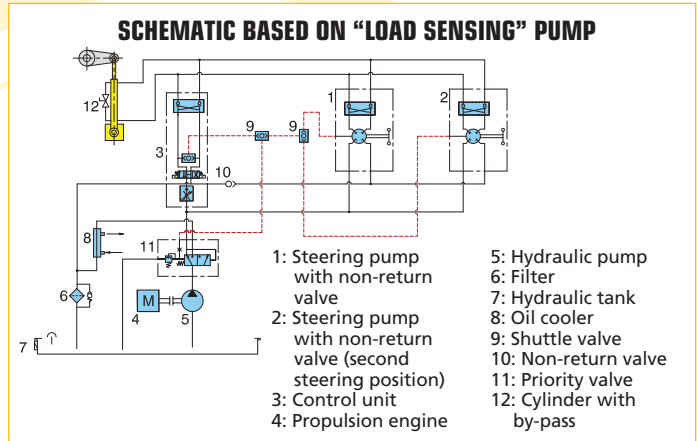
For larger boats, VETUS hydraulic power steering is a most comfortable and extremely safe steering system. The effort required at the helm is only about 10% of a non-powered steering system. In other words; the boat can be steered literally with one finger. Because of this, the steering wheel diameter can be considerably smaller than normal; a wheel diameter of just  $\varnothing$  360 mm will usually suffice.



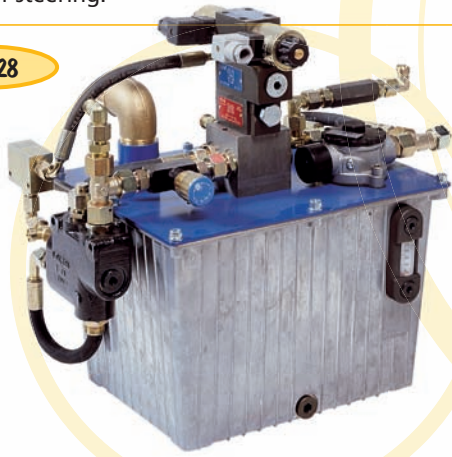
The external flange of the steering pump is made of seawater-resistant aluminium, hand polished and anodised. The steering wheel shaft is made of stainless steel, type I-4462, with a diameter of  $\varnothing$  19 mm, tapered 1:12.

The VETUS hydraulic power steering has been developed for application within the "VETUS Power Hydraulics" programme, which is based on the "constant pressure" (load sensing) principle. If your boat is equipped with a hydraulic system which does not operate on this principle, VETUS will gladly advise on how to adapt your system, in order to enable installation of this type of steering.

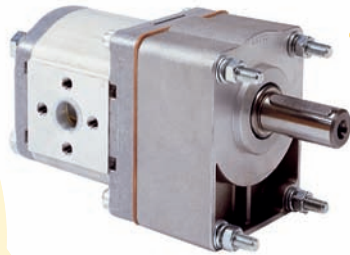
VETUS hydraulic power steering is also extremely safe. Should there be a power assistance failure, then the steering system will still operate unassisted, only with somewhat greater effort. The pump unit is in fact a rotating proportional valve. By turning the wheel, this control valve opens and directs oil under pressure to the steering cylinder connected to the rudder. The volume of hydraulic fluid that is circulated, is dependent on the model of steering pump, the number of wheel revolutions and the speed at which the wheel is turned. The VETUS steering pump has a closed mid position, ensuring that there will be no oil flow as long as the wheel remains untouched. To connect one or more VETUS steering pumps and/or an automatic pilot to a VETUS hydraulic system, a control unit model HT 1019 must be used.



**HT1028**



VETUS power steering can be connected to an existing on board hydraulic system. However, if one is not fitted and only power steering is required, this small hydraulic tank (contents about 20 litres) will be required. The tank comes complete with all the necessary control components mounted on the top. Dimensions of the tank (l x w x h): 460 x 300 x 470 mm.



**HT1029**

Although the engine manufacturer will often supply the hydraulic pump, VETUS can also offer a fixed volume hydraulic pump, which is belt driven off the main engine. This VETUS pump has a built in bearing block. Its dimensions are small and are comparable with those of the alternator. The pump has a power take-off of approximately 1 kW (1.5 hp). Dimensions (l x w x h): 220 x 90 x 112 mm. Weight : 5kg. Shaft diameter : 22 mm. Maximum shaft speed : 3,500 rpm

If an existing engine driven pump is to be used, the hydraulic flow rate must be minimum 7 l/min and maximum 40 l/min, with a maximum working pressure of 70 bar.



**HT3011**

**OIL COOLER**

If a pump with a fixed swept volume, or a high capacity is installed, or if the ambient temperature is high, a lot of heat can be generated. In these cases, the installation of an oil cooler in the return line will be required. Three different cooling water hose diameters are available:  $\varnothing$  32 (HT301132),  $\varnothing$  42 (HT301142) or  $\varnothing$  47 (HT301147).



The size of the cylinder is determined according to the size of the rudder or better still: according to the rudder torque. (How to calculate this rudder torque is shown on p. 45) See p. 43 and 44 for hydraulic cylinders.

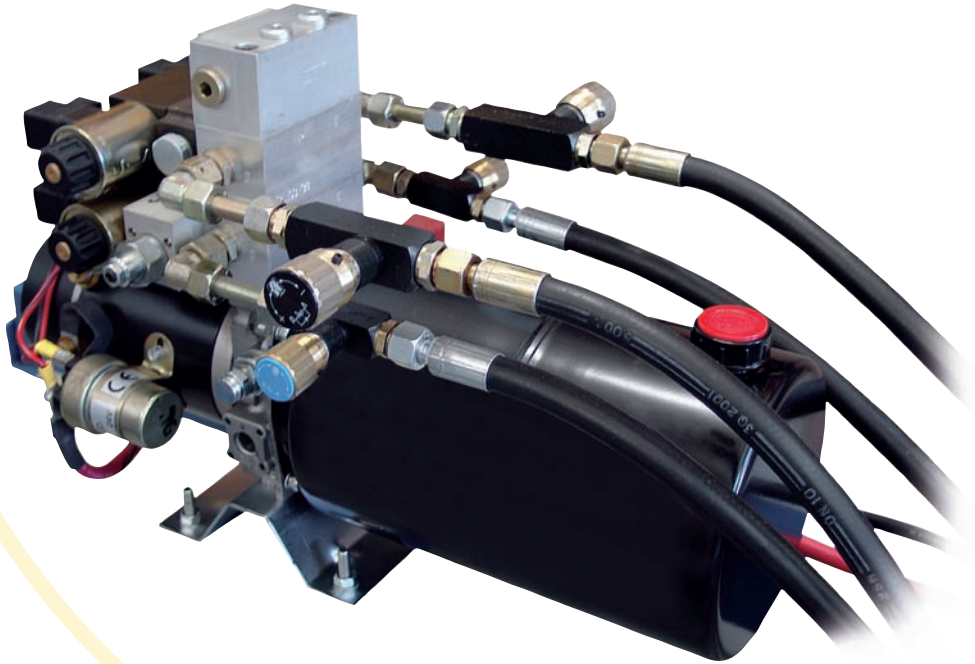
Pump type Assuming 4 – 6 steering wheel revolutions from port to starboard	Cylinder volume in cm <sup>3</sup>	VETUS cylinder model	Oil flow to steering pump litre/min.	Pipe diameter mm
HT1020 (75 cm <sup>3</sup> /rev.)	300 to 450 cm <sup>3</sup>	up to MTC175	30 ltr./min.	$\varnothing$ 10 mm
HT1018 (95 cm <sup>3</sup> /rev.)	380 to 570 cm <sup>3</sup>	up to MT230	30 ltr./min.	$\varnothing$ 18 mm
HT1025 (145 cm <sup>3</sup> /rev.)	580 to 870 cm <sup>3</sup>	up to MT345	30 ltr./min.	$\varnothing$ 18 mm

**IT GOES WITHOUT SAYING THAT VETUS WILL BE PLEASED TO OFFER TECHNICAL ADVICE AND TO PROVIDE THE REQUIRED INSTALLATION INSTRUCTIONS AND DIAGRAMS**

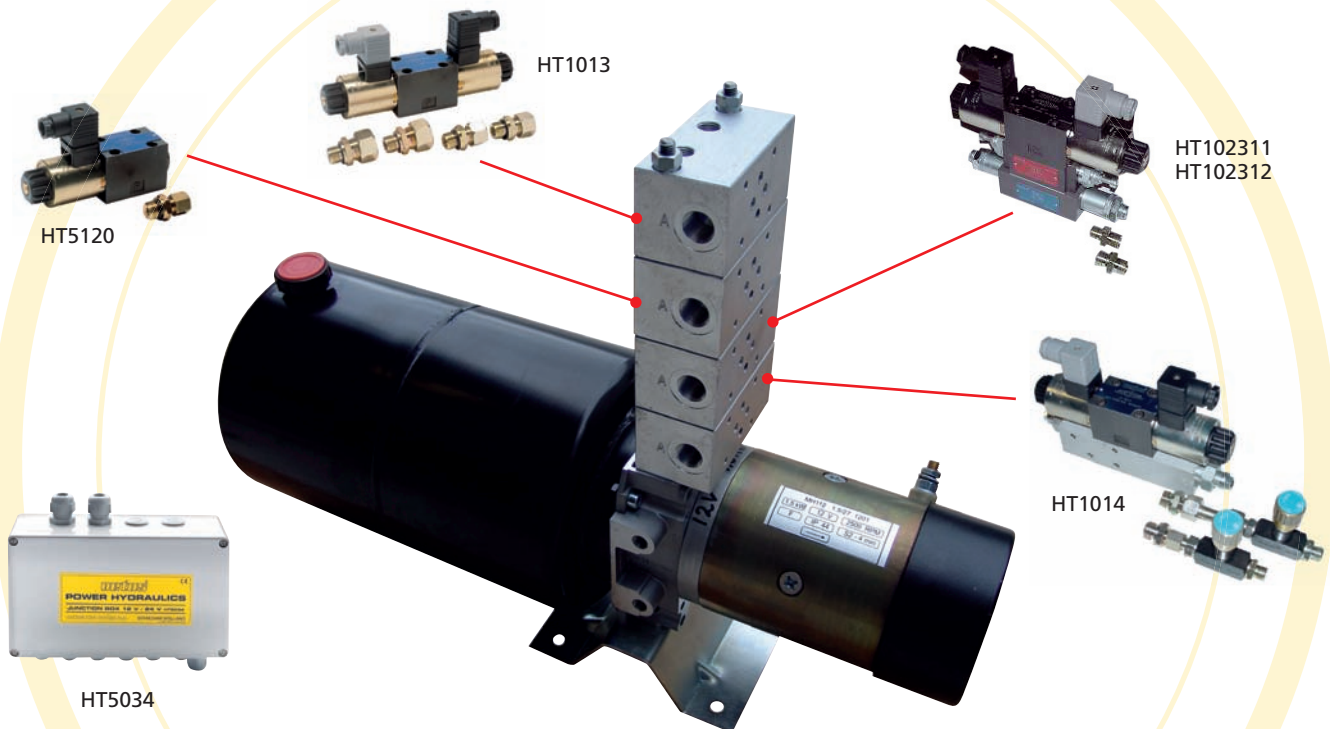
## ELECTRIC POWER PACKS, 12 AND 24 VOLT |

Most VETUS power hydraulics systems are designed to run from an engine driven hydraulic pump. With such a system on board, there can be enough power to operate many different pieces of hydraulic equipment such as bow and stern thrusters, power steering, anchor windlass, capstan, gangway etc. However, these devices can only operate when the main engine or generator are running, depending on where the pump is powered from. In certain circumstances though, it may be desirable to operate the hydraulic systems without the engine or generator running. In these cases, a VETUS electric power pack will provide the answer; either as a stand alone system or, as an additional power source in the main power hydraulics system.

Now, it just may happen, that one of these functions should be engaged for as brief moment, e.g. in a marina, in which case the propulsion engine or the generator should be started up, except if a VETUS DC POWER PACK has been installed, which can take over the function of the engine or the generator. This solution will be a tremendous asset to the comfort on board, especially if the yacht is equipped with (a) powerful engine(s).



These power packs can be supplied in various executions: 12 or 24 Volt D.C and with different power capacities, pump outputs, tank capacities, etc. They may also be supplied without the tank, in which case the system should be connected to the main hydraulic tank on board. The power pack can be used to operate a maximum of 4 functions. In the example shown here, the power pack is equipped with 4 NG6 base plates, to which standard VETUS solenoid control units may be connected (HT1013, HT1014, HT102311, HT102312). For electrical operation of the power pack and the control units, VETUS junction box HT 5034 is required together with one or more switches.



Motor yachts over 10 m length are frequently used on open waters. VETUS stabilizers are the ideal solution for drastically reducing the rolling movement of these vessels in bad weather or in heavy swells.

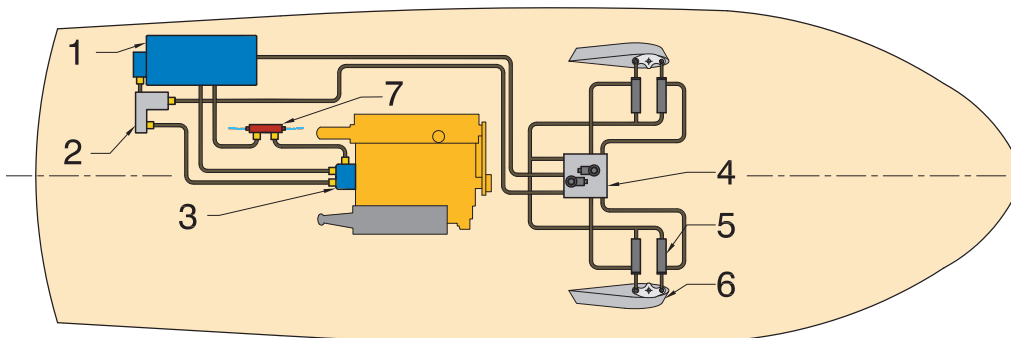


Stabilizers consist of a hydraulically actuated pair of fins that are fitted to a vessel's port and starboard midships sections underwater. They are controlled by an on board gyroscope and automatically react to the rolling movement of the vessel to create a damping effect. In other words, rolling motion is reduced considerably by the use of VETUS stabilizers, resulting in increased comfort and reduced risk of seasickness. Stabilizers can to some extent, be compared with an aircraft's ailerons, which considerably reduce movement in bad weather.

### HOW DO THEY WORK?

The stock for each stabilizer fin is controlled by a set of hydraulic cylinders. These hydraulic cylinders are operated by the on board hydraulic system, powered by the main engine(s) or generator set. A gyroscope detects vessel movement and electronics and a valve block control oil flow to the cylinders, generating a movement in the fins to counter the roll. The valve block contains a solenoid valve controlling the direction of the fins, a centering valve for when going astern and an oil pressure control unit. Hydraulic hoses connect the hydraulic pump, the valve block and the hydraulic cylinders. If there is no hydraulic system already on board, then VETUS can also supply the components for this, see pages 25 and 26.

**VALVE BLOCK**

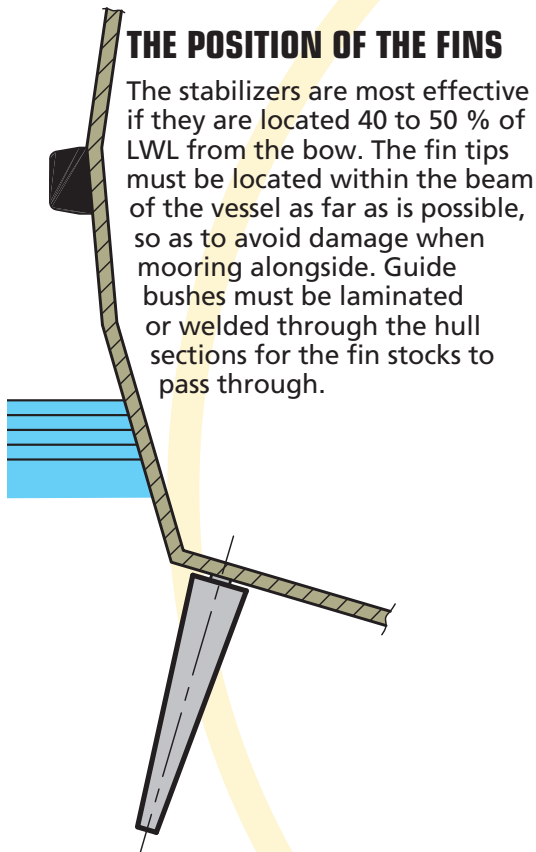


- |  |                  |                        |
|--|------------------|------------------------|
| 1 Stainless steel tank with oil cooler | secondary drive  | 5 Stabilizer cylinders |
| 2 Connection for                       | 3 Hydraulic pump | 6 Stabilizer fin       |
|  | 4 Valve block.   | 7 Oil Cooler           |

- "Plug and Play" installation for steel, GRP and aluminum vessels.
- Fully automatic operation.
- The fin movement is automatically adjusted according to the degree of damping selected, the speed of the vessel and the sea state.
- All electronic components are solid state.

## DO THEY AFFECT THE SPEED?

In smooth water with the stabilizers not in use, the speed reduction is negligible (for example: about 1 knot at 25 knots for a 25 metre vessel). In heavy seas however, a vessel using stabilizers has the advantage, because the boat rolls less and therefore has a lower wetted surface area.



## THE POSITION OF THE FINS

The stabilizers are most effective if they are located 40 to 50 % of LWL from the bow. The fin tips must be located within the beam of the vessel as far as is possible, so as to avoid damage when mooring alongside. Guide bushes must be laminated or welded through the hull sections for the fin stocks to pass through.



From the control panel the stabilizers can be switched on or off or centered for when going astern. The required amount of damping can be adjusted and the roll amplitude is displayed.  
 Dimensions: 210 x 85 x 103 mm

## WHICH SIZE?

The fin size can be calculated using the following formula:

$$\text{Fin surface in m}^2 = \frac{3,5 \times B \times D}{T^2 \times V^2}$$

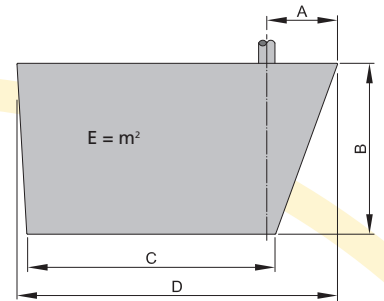
Where:

**B** is the waterline beam in metres.

**D** is the displacement in metric tons.

**T** is the roll period in seconds. This is the time taken to roll from starboard to port and back to starboard again. The amplitude is not important here since the roll period always remains constant. The roll period can therefore be measured fairly easily by causing the vessel to roll gently when moored alongside the quay.

**V** is the cruising speed in knots.



**STAFIN**

	03	04	05	06	07
A	142	176	215	250	291
B	431	497	554	600	605
C	620	716	801	873	1021
D	798	921	1024	1125	1318
E	0,3	0,4	0,5	0,6	0,7

## EXAMPLE

A 13.5 m motor yacht has waterline beam of 3.6 m. The displacement is 23 metric tons and the cruising speed is 8.5 knots. Roll period is 3.5 sec.

The recommended fin size is as follows:

$$\frac{3,5 \times 3,6 \times 23}{3,5^2 \times 8,5^2} = 0,33 \text{ m}^2$$

Thus, a fin size of 0.4 m<sup>2</sup> should be chosen or 0.3 m<sup>2</sup> if space is restricted.

## SCOPE OF SUPPLY

- A set consisting of four hydraulic cylinders with associated valve block, a control panel and a solid-state gyroscope (which registers the vessels movement). The standard power supply is 24 Volt DC (a 12 volt to 24 volt transformer is available as an option).
- A pair of fins. The stock and blade are made from stainless steel and the blade is filled with polyurethane. There is a choice of 5 fin sizes available: 0.3, 0.4, 0.5, 0.6 and 0.7m<sup>2</sup>.
- A pair of guide bushes, available for steel, GRP or aluminum hulls.



The high pressure hoses are not included and should be ordered separately to the required lengths.

## VETUS STABILISERS OVERVIEW

- "Plug and Play" installation for steel, GRP and aluminum vessels.
- Fully automatic operation.
- The fin movement is automatically adjusted according to the degree of damping selected, the speed of the vessel and the sea state.
- All electronic components are solid state.

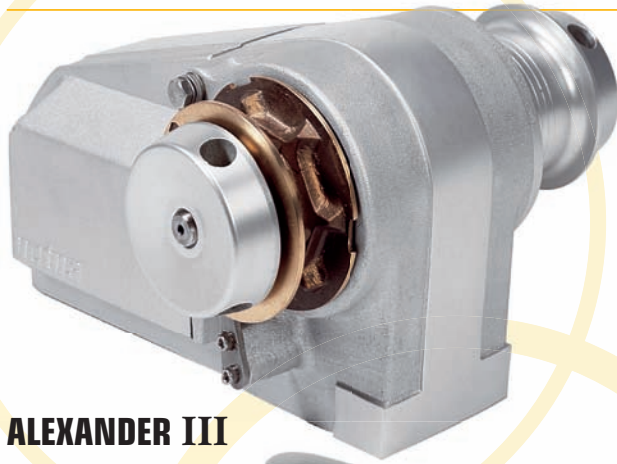


# HYDRAULIC ANCHOR WINDLASSES

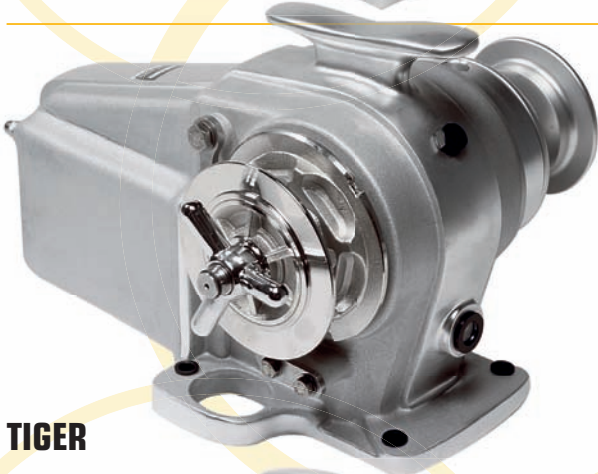
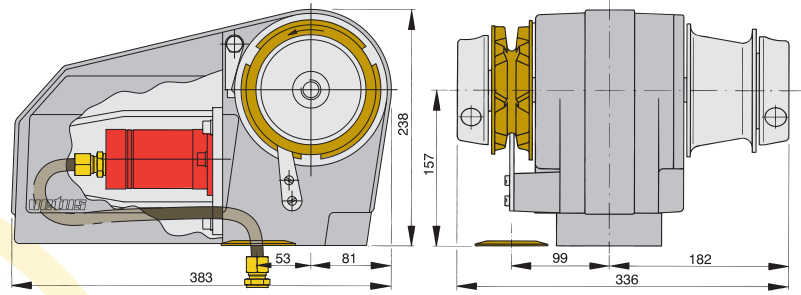
VETUS anchor windlass types Napoleon, Alexander III, Ajax, Tiger and Condor are available with a hydraulic motor instead of an electric motor. The hydraulic motor is already installed and provided with:  $\varnothing$  12 mm steel pipes (models Alexander, Tiger, Condor) or  $\varnothing$  12 mm compression fittings (models Ajax, Napoleon, Capsthm). For all other hydraulic components required to complete the installation, please see page 25, 26 and 27.

For the gipsy sizes of the Alexander III, Ajax and Condor anchor windlasses, please see the data of the electric versions. The Tiger anchor windlass may supplied with a gipsy to suit following chain sizes:  $\varnothing$  8 mm DIN 766,  $\varnothing$  8 mm ISO 4565,  $\varnothing$  5/16" BBB,  $\varnothing$  10 mm DIN 766, or  $\varnothing$  5/16" PC chain.

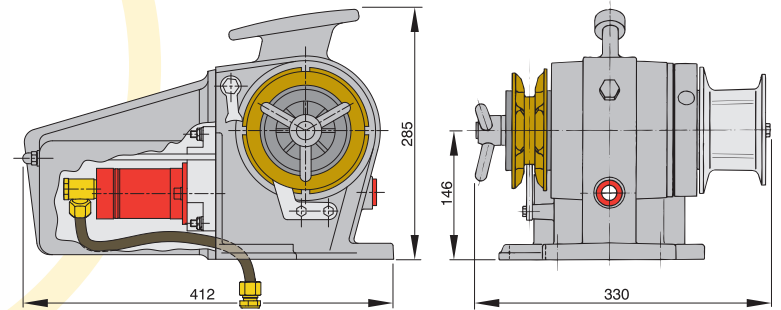
**FOR REMOTE CONTROLS, PLEASE SEE PAGE 38 AND 39**



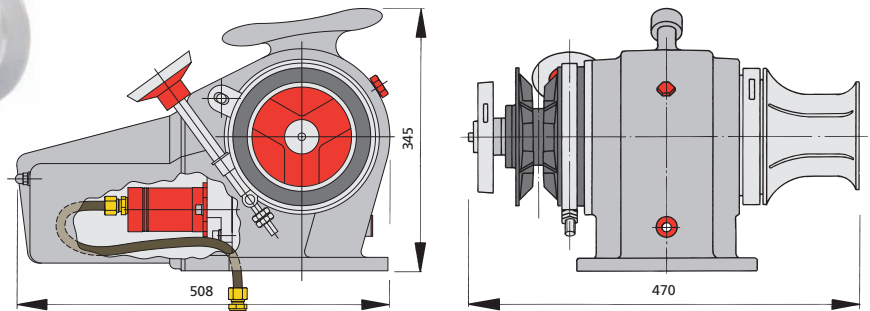
**ALEXANDER III**



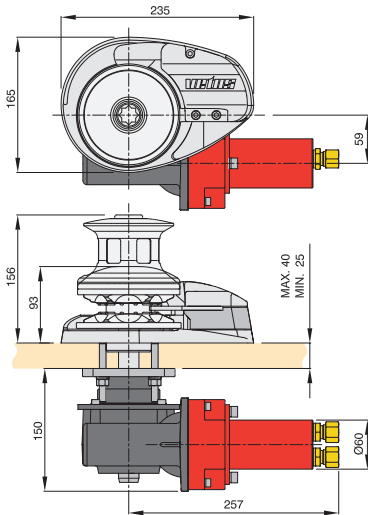
**TIGER**



**CONDOR**



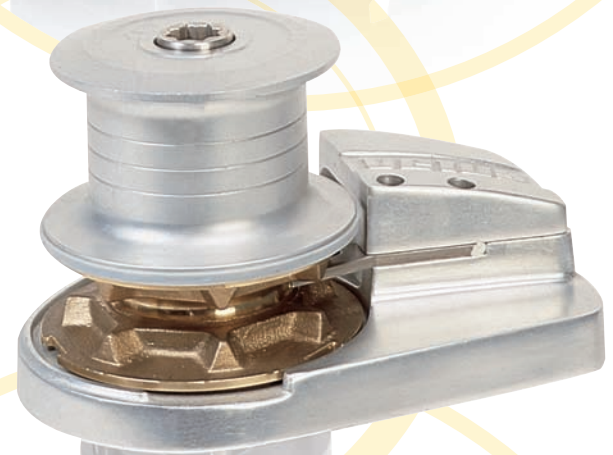
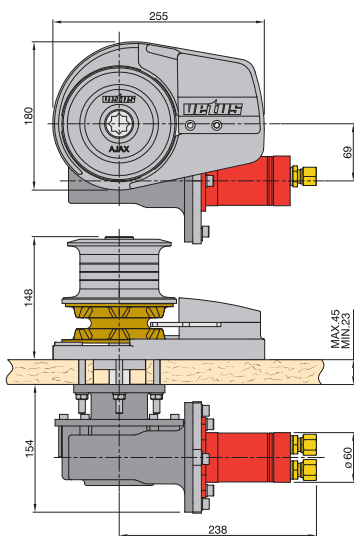
Technical data :	Alexander III	Tiger	Condor
Hydraulic motor	suitable to operate in both directions	suitable to operate in both directions	suitable to operate in both directions
Capacity hydraulic motor, cm/rev	8,2	8,2	8,2
Maximum operating pressure, bar	100	114	181
Maximum intermittent motor speed, rpm	2440	2440	2440
Chain speed at 2440 rpm, m/min	11,7	12,4	14
Lifting power, nominal / maximum, kg	350 / 500	300/550	500 /900



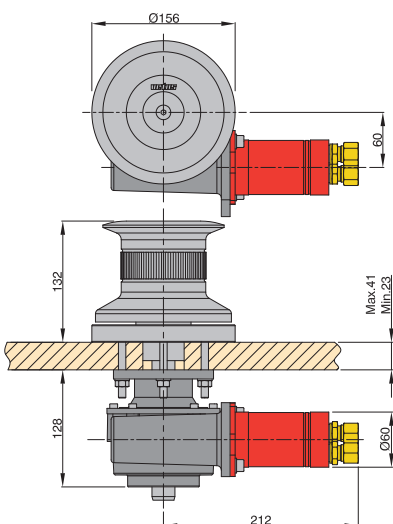
This beautiful VETUS anchor windlass is made of **cast stainless steel, type AISI 316**. The housing, cover and drum are all high-gloss polished and the overall appearance is sturdy, attractive and of course, completely corrosion free. A NAPOLEON windlass will be a useful and attractive asset on the foredeck of any boat. This hydraulic version **does not have** the chain counter feature or the built-in relays. We recommend the use of stainless steel chain, see page 37.



**NAPOLEON**



**AJAX**



## CAPSTAN

A capstan is a rotating drum winch, usually fitted to the top of larger anchor windlasses, to handle rope. With its own integral hydraulic motor, this VETUS capstan functions as an independent unit. In order to handle the stern lines when berthing, it is a useful addition when fitted to each stern quarter of larger and heavier boats. Particularly when mooring with an adverse crosswind, a capstan will greatly ease the job of the crew. The ideal configuration is: one capstan fitted to the anchor windlass and one located on either side of the transom.



**CAPSTHM**

Technical data :	Napoleon	Ajax	Capsthan
Hydraulic motor	Reversible	Reversible	Reversible
Capacity of hydraulic motor, cm <sup>3</sup> /rev	8,2	8,2	8,2
Maximum operating pressure, bar	183	100	100
Maximum intermittent motor speed, rpm	2440	2440	2440
Chain/rope speed at 2440 rpm, m/min	13,5	11,7	11,7
Lifting power, nominal / maximum, kg	350/950	350/500	350/550

## ELECTRIC ANCHOR WINDLASSES

This beautiful VETUS anchor windlass is made of cast stainless steel, type AISI 316. The housing, cover and drum are all high-gloss polished and the overall appearance is sturdy, attractive and of course, **completely corrosion free**. A NAPOLEON windlass will be a useful and attractive asset on the foredeck of any boat.



**NAPOLEON**

### GIPSY

The NAPOLEON anchor windlass may be supplied with three different gipsies. When ordering, please indicate the size required:

1. 8 mm DIN 766; 8 mm ISO 4565; 5/16" HY; 5/16" BBB and rope 14 -16 mm
2. 10 mm DIN 766 and 3/8" BBB (BBB: BBB coil chain)
3. 10 mm ISO 4565 and 3/8" HT (HT: High Test chain)

**We recommend the use of VETUS stainless steel anchor chain with this windlass (see page 37).**

### MINIMAL MAINTENANCE

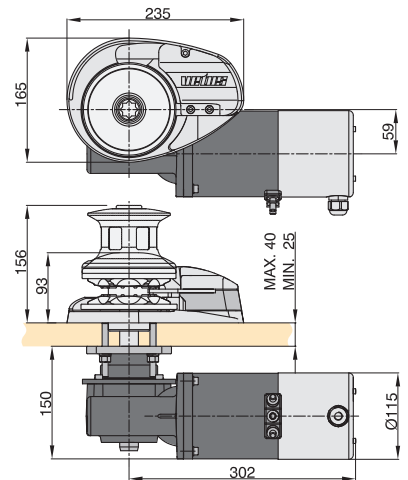
The drive mechanism of the NAPOLEON anchor windlass is lubricated for life.

### TIME-SAVING INSTALLATION

The footprint on deck is identical with that of the Ajax anchor windlass thus allowing easy upgrade or interchange ability. Dual relays are integrated in the motor housing, ensuring they are always protected from corrosion and reducing the installation time required.

- Suitable for boats between 8 and 14 metres
- Nominal lifting power: 350 kg; 950 kg maximum
- Haulage speed: 18 - 24 m/min, dependent on the load
- "Free fall" speed up to 45 m/min
- Increased paying out speed when electrically operated
- Reversible D.C. electric motor, available in 12 or 24 Volt D.C.
- Corrosion resistant motor housing, watertight to IP66
- E-terminal for manual switching of the electric motor
- Nominal power: 1,000 W, maximum 1,850 W
- Current consumption: 70 - 110 A (12 Volt), 40 - 60 A (24 Volt)
- Main shaft bearings made of stainless steel (AISI 440)
- Available with or without drum
- Material of gipsy: nickel plated bronze
- Gipsy and drum can be operated separately
- Built-in relays
- Integral chain counter sensor
- Weight: 21 kg
- Can be used with all VETUS windlass controls

A patented chain counter is incorporated, thus further reducing installation time, as there is no necessity to install a separate counter or to mark the chain.



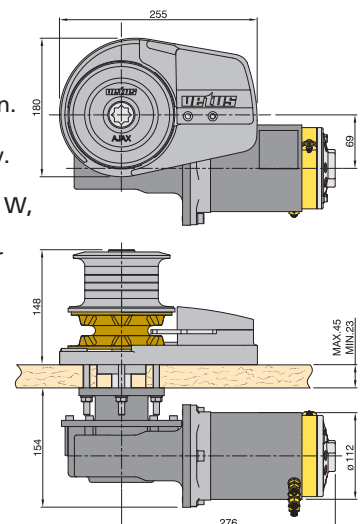
### COMPLETE

The NAPOLEON anchor windlass comes complete with fastenings. Also included is an aluminium handle for releasing or tightening the gipsy or for operating the windlass manually.

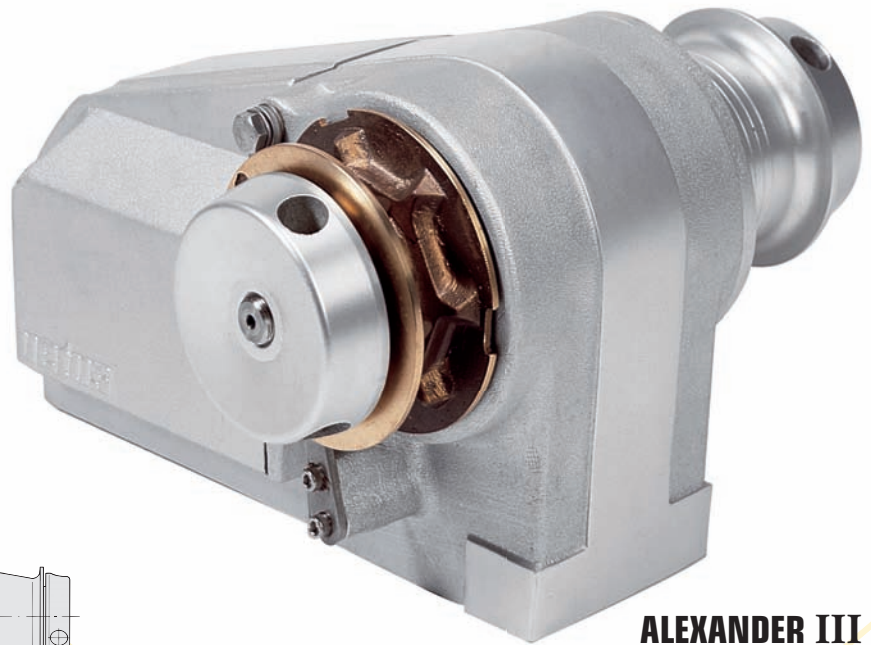
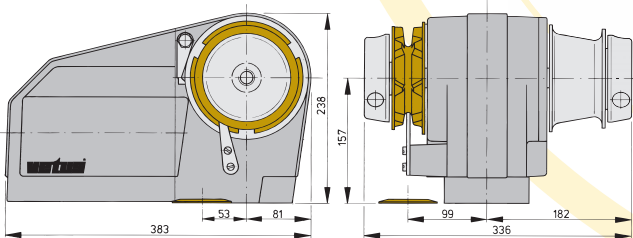


**AJAX**

- Suitable for boats of up to 13 metres (42 ft).
- Lifting power 350 kg nominal; 500 kg maximum.
- Haulage speed at 350 kg: 13,5 m/min.  
Haulage speed at 25 kg: 26 m/min.
- Greased for life.
- Drum can be operated separately.
- Equipped with electric motor of 1000 W nominal, maximum 1500 W, 12 or 24 Volt D.C. Electric motor is reversible (for dropping anchor electrically).
- Gipsy to take ø 8mm DIN 766 and 8 mm ISO 4565 or ø 10 mm DIN 766.
- Materials: casing of anodised seawater resistant aluminium. The other parts are made of corrosion resistant materials.
- Weight 20 kg.
- The installation parts are included.

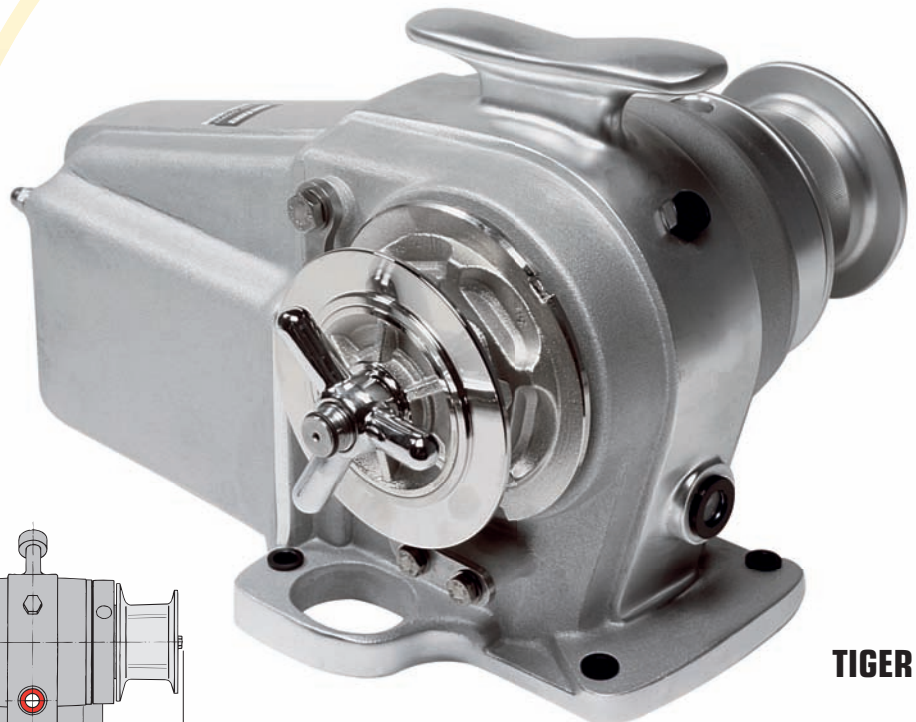
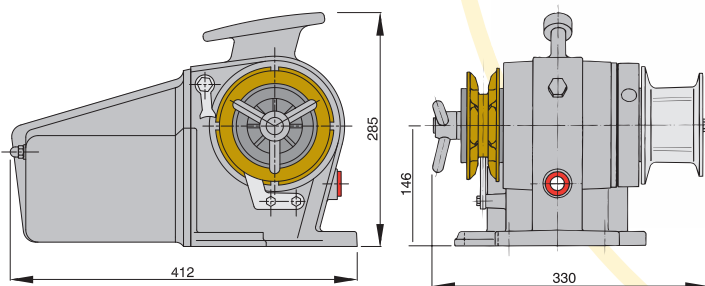


- Suitable for boats of up to 13 metres (42 ft).
- Lifting power 350 kg nominal; 500 kg maximum.
- Haulage speed at 350 kg: 13,5 m/min. Haulage speed at 25 kg: 26 m/min.
- Greased for life.
- Drum can be operated separately. Manual operation is also possible.
- Equipped with electric motor of 1000 W nominal, maximum 1500 W, 12 or 24 Volt D.C. Electric motor is reversible (for dropping anchor electrically).
- Available with gipsy to take  $\varnothing$  8 mm DIN 766 and 8 mm DIN ISO 4565 or 10 mm DIN 766.
- Materials: casing of anodised seawater resistant aluminium. The other parts are made of corrosion resistant materials.
- Weight 20 kg.
- The installation parts are included.

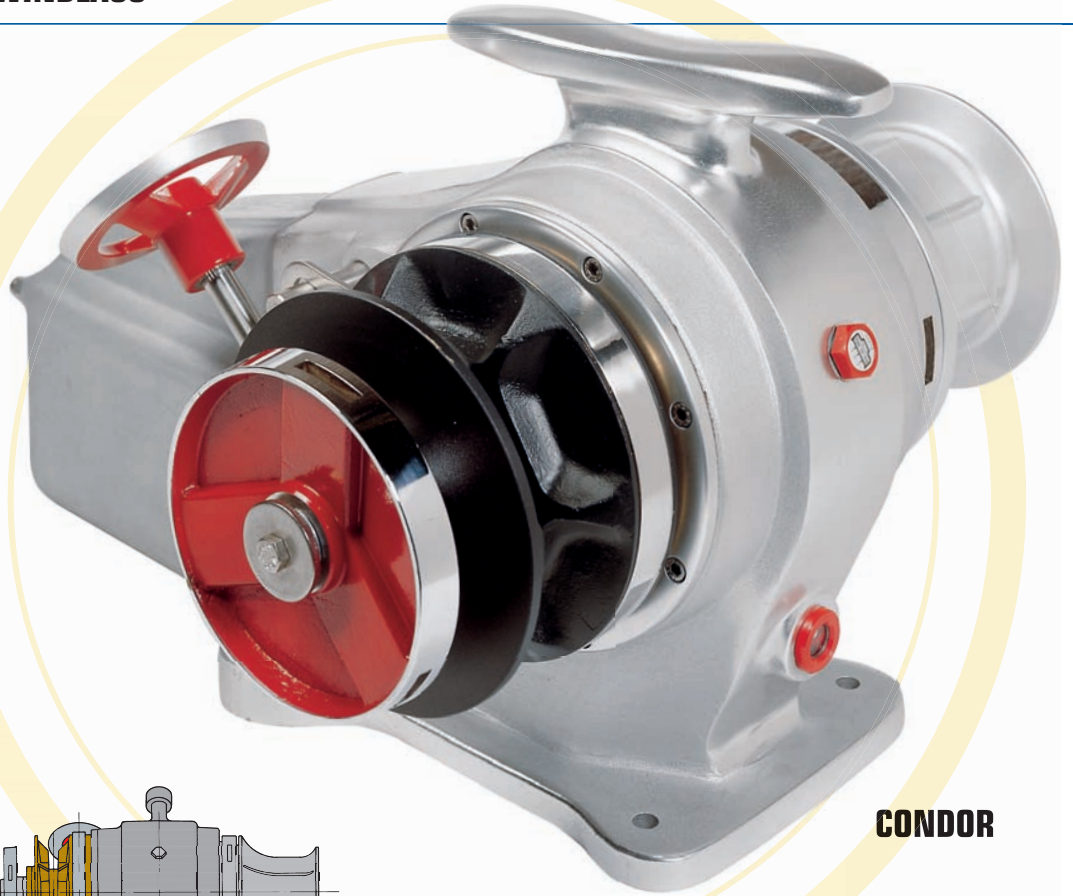

**ALEXANDER III**


**For hydraulic anchor windlasses, see page 32 and 33**

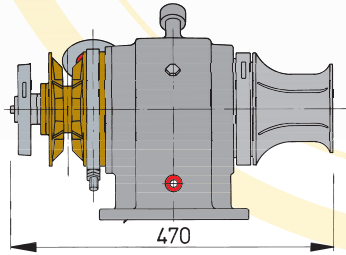
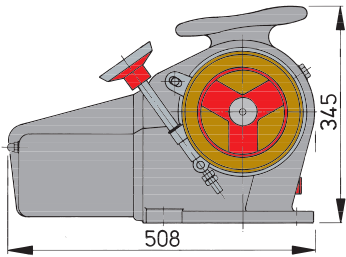
- Suitable for boats of up to 13 metres (42 ft).
- Lifting power 300 kg nominal; 550 kg maximum.
- Haulage speed at 350 kg: 13,5 m/min. Haulage speed at 25 kg: 26 m/min.
- Equipped with electric motor of 1000 W nominal, maximum 1500 W, 12 or 24 Volt D.C. Electric motor is reversible (for dropping anchor electrically).
- Available with gipsy to take  $\varnothing$  8 mm DIN 766,  $\varnothing$  8 mm ISO 4565 and  $\varnothing$  5/16" BBB or  $\varnothing$  10 mm DIN 766 and  $\varnothing$  5/16" PC or 3/8" BBB chain.
- Weight 23 kg.
- The installation parts are included.


**TIGER**


- Suitable for boats of up to 18 m in length.
- Lifting power: 500 kg nominal, 900 kg maximum.
- Gipsy to take  $\varnothing$  10 mm DIN766,  $\varnothing$  12 mm ISO 4565 or  $\varnothing$  13 mm DIN766.
- Haulage speed: 15 m/min.; maximum 22 m/min.
- Weight: 45 kg
- Equipped with a reversible electric motor (for dropping anchor electrically), 12 Volt D.C. - 1500 Watt or 24 Volt D.C. - 1500 Watt
- The chain may also be hauled in by hand.
- The drum may be operated separately.

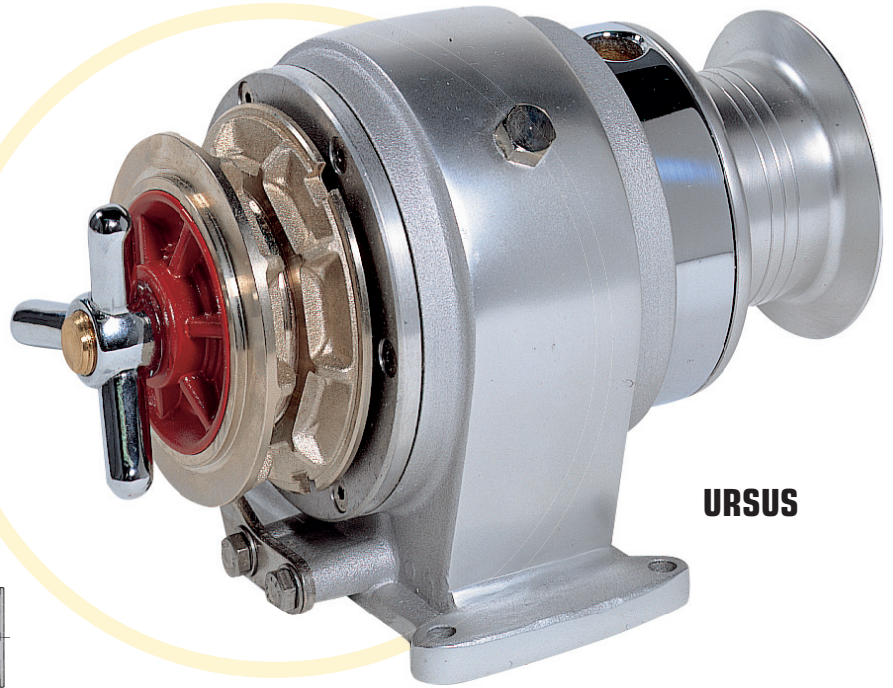


**CONDOR**

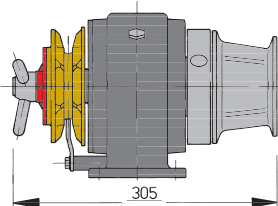
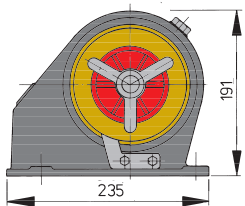


## HAND-OPERATED ANCHOR WINDLASS

- Hand-operated anchor windlass.
- Suitable for boats of up to 12 m in length.
- Lifting power 200 kg.
- Gipsy to take  $\varnothing$  8 mm DIN 766,  $\varnothing$  8 mm ISO 4565,  $\varnothing$  5/16" BBB or  $\varnothing$  10 mm DIN 766,  $\varnothing$  5/16" PC chain.
- Double acting lever.
- Weight: 9 kg.
- The drum may be operated separately.

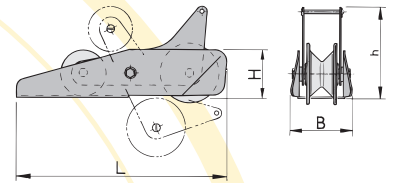


**URSUS**



**BOW ROLLERS HIGH-GLOSS POLISHED STAINLESS STEEL (AISI 316)**

**HINGED**



Type	L	B	H	h
Asterix	320	92	72	133
Obelix	430	160	100	190

**TYPE ASTERIX**

Suitable for rope and chain of up to 8 mm (5/16").

**TYPE OBELIX**

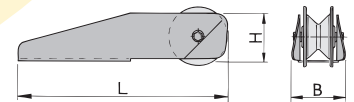
Suitable for rope and chain of up to 13 mm (1/2").

**FIXED**



**TYPE ED**

Suitable for rope and chain of up to 13 mm (1/2").



Type	L	B	H
Polly	205	72	74
Francis	320	86	74
Ed	444	110	110

**TYPE POLLY AND FRANCIS**

Suitable for rope and chain of up to 8 mm (5/16").

**ANCHOR CHAIN**



For an anchor windlass to function correctly, it is absolutely essential that the anchor chain is correctly matched to the windlass gipsy. VETUS can supply  $\varnothing$  8, 10 and 13 mm calibrated anchor chain according to DIN 766, in galvanised steel or in polished stainless steel (AISI 316), in lengths of 30, 50 or 100 metres. **Because of its smoother finish, stainless steel chain flakes itself more easily and evenly into the chain locker.**



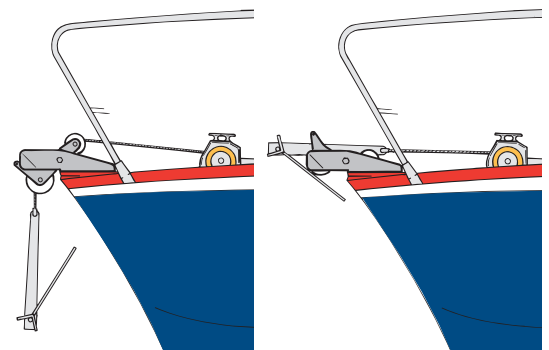
8 mm - 1,35 kg/m

10 mm - 2,25 kg/m

13 mm - 3,8 kg/m

**STAINLESS STEEL CHAIN STOPPER**

For 8 or 10 mm anchor chain. Prevents damage to the drive mechanism of the anchor winch. Rated up to 2500 kg load.



With the ASTERIX and OBELIX bow rollers the anchor can be pulled up and stored very easily via the Nylon rollers and the cleverly designed hinging system.

# REMOTE CONTROLS FOR HYDRAULIC AND 12 OR 24 VOLT ELECTRIC ANCHOR WINDLASSES

## REMOTE CONTROL PANELS FOR NAPOLEON ANCHOR WINDLASS

These remote control panels can be used to haul-in or release the anchor chain. Model CCM has an illuminated LCD screen, providing indication of:

- the programming menu
- the chain speed, both hauling in or releasing
- the length of chain released
- the supply voltage and current consumption

In addition, a programmable cut-out may be set, so that the windlass will stop automatically as the anchor arrives at the bow roller. Model CCFB is a simplified version of model CCM. It can also be used to haul in or release the chain. The illuminated LCD screen indicates the length of anchor chain released. The panels can be set to read in metres or feet and are suitable for both 12 and 24 Volt installations. They are both watertight according to IP 65.



CCFB



CCM

Dimensions: CCM: 100 x 100 x 32 mm  
CCFB: 60 x 60 x 18 mm  
Current drain: CCM: 5 - 40 mA  
CCFB: 20 mA

Hand operated push-button switches.



AFSTPB

These **watertight** (IP65) foot switches may be used instead of, or in addition to the push-button switches, of course always in combination with one or two relays.

The foot switches have a protective cover, to avoid accidental engaging of the solenoids. Available with red (up) or grey (down) covers.



AFSTFR

AFSTFG



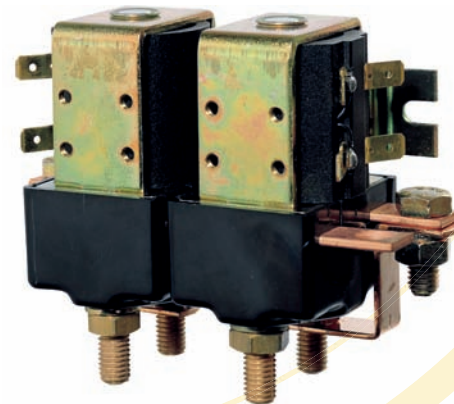
AFST1512S

SOL1512S\*

SOL324S\*

AFST324S

Make relay for lifting only of all types of electric anchor windlasses, with a motor of maximum 1,5 kW at 12 Volt or of 3 kW at 24 Volt D.C. For hauling **and** releasing, two of these control switches may be fitted.  
\* **Watertight to IP65.**



AFST1512D

SOL324D\*

SOL1512D\*

AFST324D

Make/break relay for hauling in and releasing the anchor using a windlass with a motor of maximum 1,5 kW output at 12 Volt DC or of 3 kW at 24 Volt DC.

AFST624S

Make relay for lifting only of all types of electric anchor windlasses, with a motor of maximum 6 kW at 24 Volt. For hauling **and** releasing, two of these control switches may be fitted.

AFST624D

Make/break relay for hauling in and releasing the anchor using a windlass with a motor of maximum 6 kW output at 24 Volt D.C.

## REMOTE CONTROLS FOR HYDRAULIC AND 12 OR 24 VOLT ELECTRIC ANCHOR WINDLASSES |

This control panel when connected to a make/break relay can be used for hauling in and releasing the anchor. It has an on/off switch and LED and is suitable for both 12 and 24 Volts D.C. Dimensions are 85 x 85 mm and the build in depth is 78 mm. Watertight to IP65.



AW PANEL

This **radio control** may be used for remote operation of VETUS bow and/or stern thrusters and anchor windlasses. Two models are available:

- Model REMCO1, consisting of 1 receiver and 1 hand-held control with 2 push-buttons, for one anchor windlass or one bow thruster.
- Model REMCO2, consisting of 1 receiver and 1 hand-held control with 4 push-buttons, for operation of both the anchor windlass and the bow thruster, or alternatively, the bow and stern thruster (not simultaneously).

This remote control is also suitable to operate other electrically driven equipment on board. Additional hand-held controls (transmitters) are available separately; please see the price-list.



REMCO1

REMCO2

Frequency: 433,95 Mhz.  
 Suitable for 12 and 24 Volt D.C.  
 Maximum range: 50 metres  
 Guaranteed range: 15 metres  
 Maximum capacity: 25 A at 12 Volt.  
 Hand-held control **watertight** to IP65.



This **electric remote control** consists of: a rocker switch with a capacity of 20 A, suitable for 12 and 24 Volt D.C., and a three-core spiralled wire of 3,5 metres in length, complete with watertight plug and socket. This remote control comes in handy for the operation of: bow and stern thrusters, anchor windlasses, remote controlled gangways, electric cranes, hydraulic steering systems, etc. A stainless steel hanger loop is fitted on the back.



RECON



## HYDRAULIC STEERING SYSTEMS (WITH AXIAL PISTON PUMP)

Careful attention to detail and modern technology enable us to offer truly top-class hydraulic steering systems.

### CONSTRUCTION

Our hydraulic steering systems consist of a hydraulic pump and cylinder, connected by means of tubes (copper, steel or nylon).

The pump is of the axial piston type, with small pistons inside, which are directly actuated by the steering wheel; certainly not the cheapest, but the only good system for safe and reliable hand-hydraulic steering. The cylinder is of the double-acting type and mounted on a base, allowing it to swing according to the arc described by the rudder tiller.

### OPERATION

The manually operated system creates its hydraulic power through rotation of the steering wheel.

It does not depend on the electric or propulsion system of the boat for its energy.

### QUALITY

All parts are manufactured to the highest standards and of the best materials, for long service life, corrosion resistance and operating efficiency. Nearly 40 years of experience in this field gives us an undisputed lead over many others.

### INSTALLATION

This is a very simple matter.

All that is required is to connect the pump to the cylinder by means of copper, steel or nylon tubes.

### MAINTENANCE

Once the steering is properly installed, only minimal maintenance is necessary.

### AUTOMATIC PILOT

Our hydraulic steering systems can be used to advantage together with an automatic pilot (for this, also see the VETUS electro-hydraulic pumps, page 49).

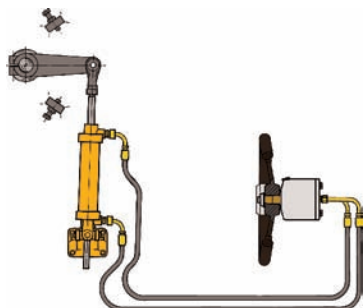


Hydraulic steering pumps type HTP and HTPR are supplied as standard:

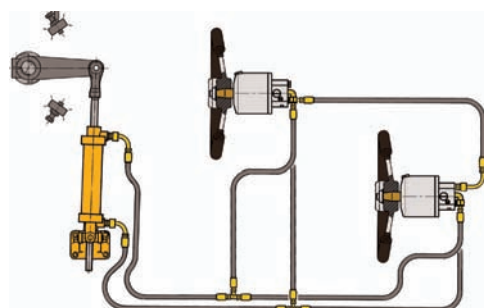
- In the colours Off White (RAL9002) or Black (RAL 9005).
- With compression fittings for the pressure lines and a balance pipe.
- With fixing studs, nuts and washers.
- With one vented and one un-vented filler plug.

Pump types HTPR have in addition:

- Integral non-return valves with a continuous air bleeding system.
- Integral pressure relief valves, giving protection against over pressurisation of the system.



Single station



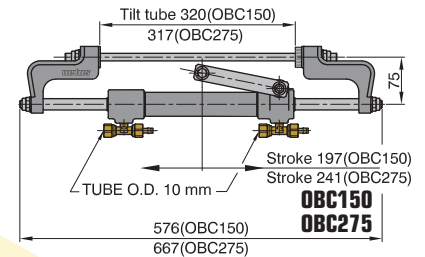
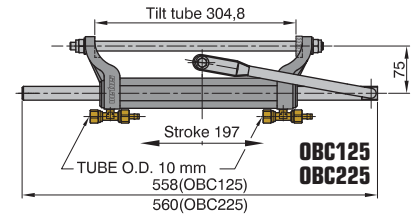
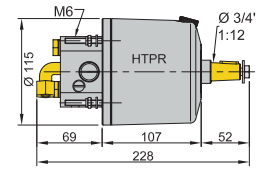
Dual station

# HYDRAULIC STEERING SYSTEMS FOR OUTBOARD ENGINES

The VETUS hydraulic steering system for outboard motors consists of a steering pump with integrated non-return and pressure relief valves, plus a steering cylinder and connection hoses. There is a choice of four hydraulic cylinders, suitable for outboard motors with an output of between 90 kW (125 hp) and 220 kW (300 hp). The steering pumps are also provided with a continuous air bleeding point. The pump and the cylinder are connected with nylon hydraulic hose.


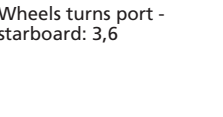
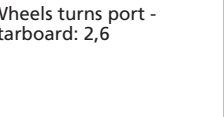

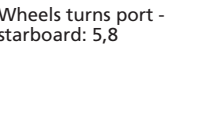
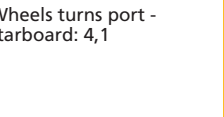

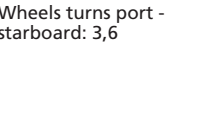
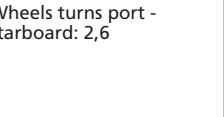

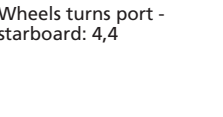
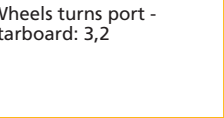


- Balanced cylinder
- Supplied with combined Ø 10 mm hose connections and bleed nipples
- Piston rod has scraper seals to prevent damage from salt and dirt

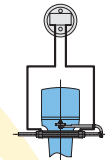


## HOW TO ORDER?

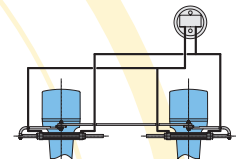
The following components are required: One or two cylinders, type OBC. Please see below for the maximum engine horsepower possibilities. One or two steering pumps, type HTP with built in non-return valves. The required length of hydraulic hose, type HHOSE8, ø 8 x 12 mm. Straight or right angle hose connectors. Hydraulic fluid. T-pieces for ø 10 mm pipe, when more than one pump or cylinder is installed.

Technical data:	HTP 2010R	HTP 3010R	HTP 4210R
<b>Maximum operating pressure:</b> 70 bar <b>Connections:</b> G 1/4 - ø 10 mm <b>Nylon hose:</b> ø 8 x 12 mm <b>Pump fitting:</b> Front Mount	<b>Capacity:</b> 19,9 cm <sup>3</sup> /rev. <b>Number of pistons:</b> 5 <b>Weight:</b> 4,1 kg	<b>Capacity:</b> 30,0 cm <sup>3</sup> / rev. <b>Number of pistons:</b> 5 <b>Weight:</b> 4,1 kg	<b>Capacity:</b> 42,0 cm <sup>3</sup> / rev. <b>Number of pistons:</b> 7 <b>Weight:</b> 4,1 kg
<b>OBC 125</b> Maximum rudder torque: 643 Nm Volume: 108,3 cm <sup>3</sup> Maximum output: 90 kW (125 hp) Maximum speed: 85 km/h (45 knots)	 Wheels turns port - starboard: 5,5	 Wheels turns port - starboard: 3,6	 Wheels turns port - starboard: 2,6
<b>OBC125 the piston rod moves inside the cylinder</b>			
<b>OBC 225</b> Maximum rudder torque: 1026 Nm Volume: 172,6 cm <sup>3</sup> Maximum output: 165 kW (225 hp) Maximum speed: 85 km/h (45 knots)	 Wheels turns port - starboard: 8,8	 Wheels turns port - starboard: 5,8	 Wheels turns port - starboard: 4,1
<b>OBC225 the piston rod moves inside the cylinder</b>			
<b>OBC150</b> Maximum rudder torque: 643 Nm Volume: 108,3 cm <sup>3</sup> Maximum output: 110 kW (150 hp) Maximum speed: 85 km/h (45 knots)	 Wheels turns port - starboard: 5,5	 Wheels turns port - starboard: 3,6	 Wheels turns port - starboard: 2,6
<b>OBC150 the cylinder moves over the piston rod</b>			
<b>OBC275</b> Maximum rudder torque: 791 Nm Volume: 132,6 cm <sup>3</sup> Maximum output: 220 kW (300 hp) Maximum speed: 110 km/h (60 knots)	 Wheels turns port - starboard: 6,8	 Wheels turns port - starboard: 4,4	 Wheels turns port - starboard: 3,2
<b>OBC275 the cylinder moves over the piston rod</b>			

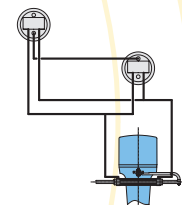
## SINGLE STEERING POSITION FOR 1 ENGINE



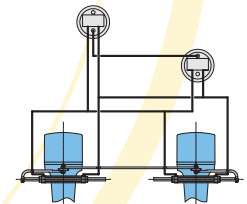
## SINGLE STEERING POSITION FOR 2 ENGINES



## DUAL STEERING POSITION FOR 1 ENGINE



## DUAL STEERING POSITION FOR 2 ENGINES



A single OBC cylinder can operate a **twin** outboard motor installation. If both propellers rotate in the same direction, the total engine output may not exceed the maximum capacity of the selected cylinder. If the motors have handed (counter-rotating) propellers, the total output may be twice the rated capacity of the chosen cylinder.

This tie bar is suitable for two outboard motors of up to 300 hp each. All components are made of stainless steel. The bar has adjustable ends and the connection bolts (3/8" UNF) are supplied as standard. The maximum centre-to-centre distance between the steering arms is 915 mm and the rod can be easily cut to the required length.



**OB1000**

Many VETUS clients like to determine the cylinder/pump unit combination themselves so as to arrive at the required number of steering wheel revolutions.

**Note:** the smaller the number of revolutions, the more force must be applied to the steering wheel. **PLEASE SEE ADJACENT PAGE FOR CHOICE OF OPTIONS.**

## SINGLE STATION CONTROL



## DUAL STATION CONTROL

All VETUS steering pumps have a  $\varnothing 3/4"$  shaft, tapered 1:12. By virtue of this, almost all steering wheels available on the market, including the VETUS wheels, can be fitted. Please see also page 46 and 47.

## HOW TO ORDER?

A hydraulic steering system consists of: one or more steering pump(s), a separate valve block or built-in non-return valve(s), as the case may be and the required length of tubing, made of nylon, copper or steel.

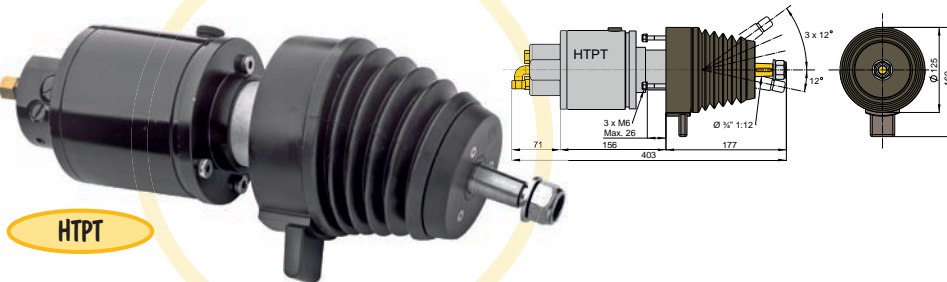
### SINGLE STEERING POSITION

- One steering pump with or without built-in non-return valves.
- One cylinder.
- Hydraulic tubing (plus accessory fittings, as required).
- Hydraulic fluid (see page 45).
- Options: separate dual non-return valve by-pass valve (see page 45).

### DUAL STEERING POSITION

- Two steering pumps with built-in non-return valves. Alternatively: two steering pumps without non-return valves, in which case a separate dual non-return valve block must be fitted.
- One cylinder.
- Hydraulic tubing (plus accessory fittings, as required)
- Hydraulic fluid (see page 45).
- Option: by-pass valve (see page 45).

## VETUS TILTING STEERING PUMPS TYPE HTPT



These steering pumps are provided with a tilt mechanism, allowing the steering wheel to be locked in 5 different positions, over an arc of 48°. This device ensures that the steering wheel can be adjusted to suit both seated and standing steering positions. The steering wheel shaft is made of stainless steel. All other visible parts are made of black rubber or corrosion free synthetic material. These pumps are supplied with built-in non return valves and pressure relief valve and feature the same technical specifications as type HTPR steering pumps. This pump is designed for through bulkhead installation. Weight: 6,6 kg.

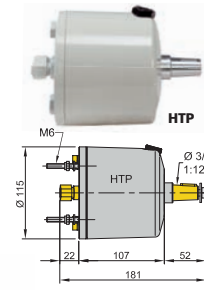
A special filler cap kit is available as an option, for use with the tilting steering pumps type HTPT. With this kit it is possible to position the filler cap in a convenient location, so that the pump can be filled and the fluid level easily checked.

## HYDRAULIC FLUID HEADER TANK

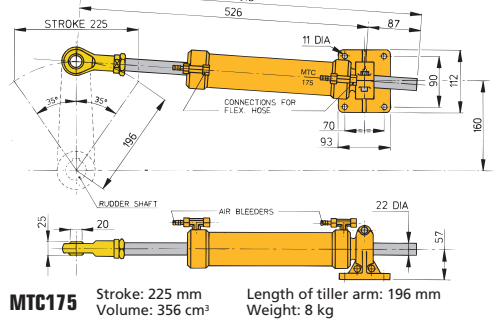
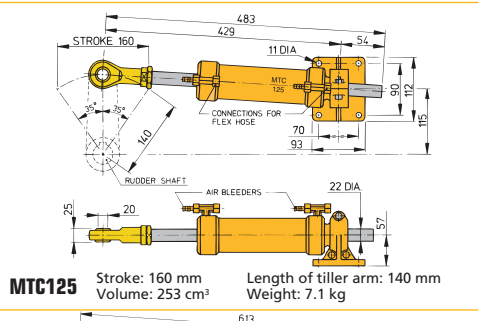
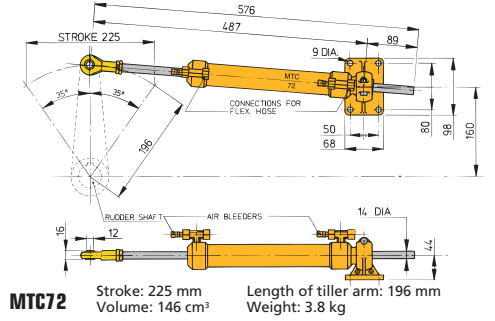
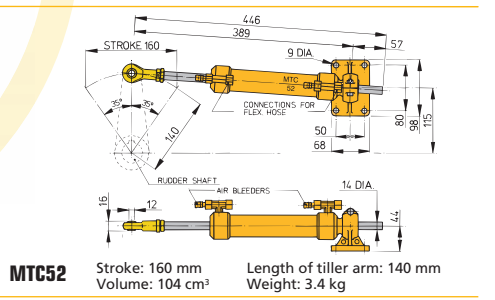
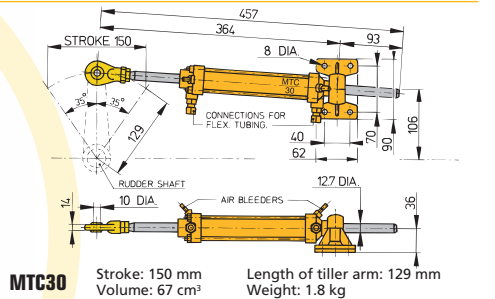
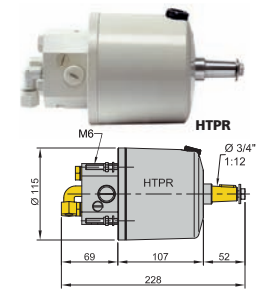
This transparent tank can be installed with all Vetus steering pumps up to 89 cm<sup>3</sup> per revolution. It is also recommended for electro-hydraulic hatch lifters, when operating more than one cylinder. It has a capacity of about 200 cm<sup>3</sup> and is supplied with a large vented screw cap, for easy filling and a mounting bracket. The tank comes complete with 1 metre of  $\varnothing 8$  mm hose, two matching hose clips, one G  $1/4$  and one G  $3/8$  brass hose pillar.



Steering pump **without** non-return valve or pressure relief valve. See page 43.



Steering pump **with** built-in non-return valve and incorporated pressure relief valve. See page 43.



**Technical details:**

Pressure MTC30: 3923 kPa (40 kg/cm<sup>2</sup>) (569 lbs/sq.inch).  
 Pressure MTC52-175: 5492 kPa (56 kg/cm<sup>2</sup>) (797 lbs/sq.inch). Connections: G 1/4 female pipe thread.  
 Total rudder angle: 70° (2 x 35°).

In the case of a **dual** steering position, in order to change over from one position to another, the installation of **non-return valves** is required. The ideal solution will then be: the installation of two steering pumps, with integrated non-return valve. Another solution could be: steering pumps **without** integrated non-return valve, plus installation of a **separate** non-return valve block. In the case of single station control, installation of a steering pump **without** integrated non-return valve will suffice in most cases. This set-up will provide feed back from the rudder to the wheel. Both steering pump models HTP and HTPR may be fitted with the shaft at any angle between horizontal and vertical. Pump types HTPR are provided with a non-return valve, a pressure relief valve, as well as a "continuous air bleeding system".

**Steering pumps without non-return valve**

Capacity: 19,7 cm<sup>3</sup>/rev.  
 Number of pistons: 5  
 Weight without valve: 3.3 kg  
 Weight with valve: 4,1 kg



**HTP 20**

Capacity: 30,0 cm<sup>3</sup>/rev.  
 Number of pistons: 5  
 Weight without valve: 3.3 kg  
 Weight with valve: 4,1 kg



**HTP 30**

Capacity: 42,0 cm<sup>3</sup>/rev.  
 Number of pistons: 7  
 Weight without valve: 3.3 kg  
 Weight with valve: 4,1 kg



**HTP 42**

**Steering pumps with integral non-return valve and pressure relief valve**



**HTP 20 R**

**Wheel turns: 3.4**

Max. Torque:  
**294 Nm (30 kgm)** (216 ft.lbs)  
 Wheel turns port - sbd: 3.4  
 Tubing:  
 nylon hose  
 Ø 6 x Ø 8 mm  
**MT 30**



**HTP 30 R**

**Wheel turns: 2.3**

Max. Torque:  
**294 Nm (30 kgm)** (216 ft.lbs)  
 Wheel turns port - sbd: 2.3  
 Tubing:  
 nylon hose  
 Ø 6 x Ø 8 mm



**HTP 42 R**

- Compact dimensions
- Supplied with compression fittings
- "Non-leak" bleed valves for easy filling
- Stainless steel piston rod
- Seawater resistant brass cylinder and base plate (except MTC30)
- Articulated joint to permit rudder movement
- Long life piston seals

**MTC 30**



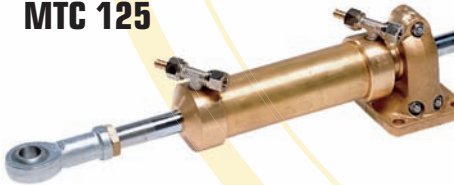
**MTC 52**



**MTC 72**



**MTC 125**



**MTC 175**



**Wheel turns: 5.3**

Max. Torque:  
**510 Nm (52 kgm)** (376 ft.lbs).  
 Torque at 35° and  
 56 kg/cm<sup>2</sup>: 412 Nm  
 (42 kgm) (304 ft.lbs)  
 Wheel turns port - sbd: 5.3  
 Tubing:  
 nylon hose  
 Ø 6 x Ø 10 mm  
 copper Ø 8 x Ø 10 mm  
**MT 52**

**Wheel turns: 3.5**

Max. Torque:  
**510 Nm (52 kgm)** (376 ft.lbs).  
 Torque at 35° and  
 56 kg/cm<sup>2</sup>: 412 Nm  
 (42 kgm) (304 ft.lbs)  
 Wheel turns port - sbd: 3.5  
 Tubing:  
 nylon hose  
 Ø 6 x Ø 10 mm or Ø 8 x Ø 12 mm  
 copper Ø 8 x Ø 10 mm

**Wheel turns: 2.5**

Max. Torque  
**510 Nm (52 kgm)** (376 ft.lbs).  
 Torque at 35° and  
 56 kg/cm<sup>2</sup>: 412 Nm  
 (42 kgm) (304 ft.lbs)  
 Wheel turns port - sbd: 2.5  
 Tubing:  
 nylon hose  
 Ø 6 x Ø 10 mm or Ø 8 x Ø 12 mm  
 copper Ø 8 x Ø 10 mm

**Wheel turns: 7.5**

Max. Torque:  
**706 Nm (72 kgm)** (521 ft.lbs)  
 Torque at 35° and  
 56 kg/cm<sup>2</sup>: 589 Nm  
 (60 kgm) (434 ft.lbs)  
 Wheel turns port - sbd: 7.5  
 Tubing:  
 nylon hose  
 Ø 6 x Ø 10 mm  
 copper Ø 8 x Ø 10 mm  
**MT 72**

**Wheel turns: 4.9**

Max. Torque:  
**706 Nm (72 kgm)** (521 ft.lbs)  
 Torque at 35° and  
 56 kg/cm<sup>2</sup>: 589 Nm  
 (60 kgm) (434 ft.lbs)  
 Wheel turns port - sbd: 4.9  
 Tubing:  
 nylon hose  
 Ø 6 x Ø 10 mm or Ø 8 x Ø 12 mm  
 copper Ø 8 x Ø 10 mm

**Wheel turns: 3.5**

Max. Torque:  
**706 Nm (72 kgm)** (521 ft.lbs)  
 Torque at 35° and  
 56 kg/cm<sup>2</sup>: 589 Nm  
 (60 kgm) (434 ft.lbs)  
 Wheel turns port - sbd: 3.5  
 Tubing:  
 nylon hose  
 Ø 6 x Ø 10 mm or Ø 8 x Ø 12 mm  
 copper Ø 8 x Ø 10 mm

**Wheel turns: 8.5**

Max. Torque:  
**1226 Nm (125 kgm)** (904 ft.lbs)  
 Torque at 35° and  
 56 kg/cm<sup>2</sup>: 981 Nm  
 (100 kgm) (723 ft.lbs)  
 Wheel turns port - sbd: 8.5.  
 Tubing:  
 nylon hose  
 Ø 6 x Ø 10 mm or Ø 8 x Ø 12 mm  
 copper Ø 8 x Ø 10 mm  
**MT125**

**Wheel turns: 6.1**

Max. Torque:  
**1226 Nm (125 kgm)** (904 ft.lbs)  
 Torque at 35° and  
 56 kg/cm<sup>2</sup>: 981 Nm  
 (100 kgm) (723 ft.lbs)  
 Wheel turns port - sbd: 6.1.  
 Tubing:  
 nylon hose  
 Ø 6 x Ø 10 mm or Ø 8 x Ø 12 mm  
 copper Ø 8 x Ø 10 mm

**Wheel turns: 8.5**

Max. Torque:  
**1717 Nm (175 kgm)** (1266 ft.lbs)  
 Torque at 35° and  
 56 kg/cm<sup>2</sup>: 1373 Nm  
 (140 kgm) (1013 ft.lbs)  
 Wheel turns port - sbd: 8.5.  
 Tubing:  
 nylon hose  
 Ø 6 x Ø 10 mm or Ø 8 x Ø 12 mm  
 copper Ø 8 x Ø 10 mm  
**MT 175**

As an option, the cylinders on this page are available with stainless steel rod ends instead of the standard zinc plated steel. MTC30: rod ends with M10 female thread. MTC52-72: rod ends with M12 female thread. MTC125-175: rod ends with M20 female thread. Please see the price list.

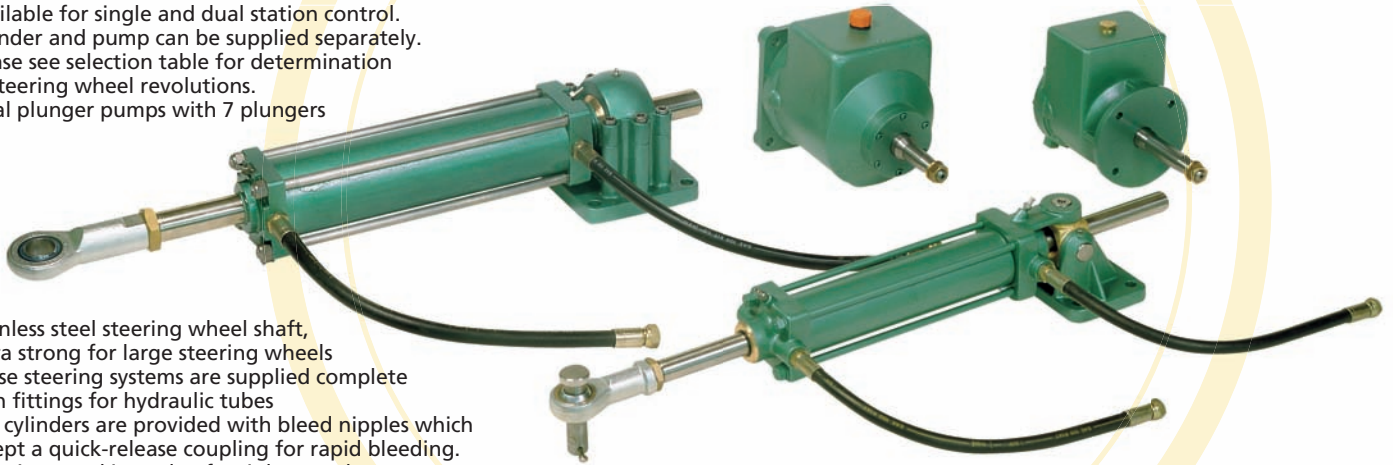
**Rudder arm connection kit**

For all VETUS hydraulic cylinders on this page, a kit to connect the rod end to the rudder arm is available as an option. All components are made from stainless steel. MTC 30 cylinder is M10. MTC 52 and MTC 72 cylinders are M12. MTC 125 and MTC 175 cylinders are M20.

The bleed nipples on all VETUS hydraulic cylinders can be fitted with a quick-release coupling in order to perform the job quickly and without spilling hydraulic fluid. These quick-release couplings close down automatically when removed and can be connected to a Ø 8 mm bleed hose. An ideal piece of equipment for the many installation engineers who are regularly installing VETUS hydraulic steering systems. A set of two couplings is available as an extra. Please see the price list.

## for commercial craft MT 230 - MT 345 - MT 455 - MT 600 - MT 900 and MT 1200

- Available for single and dual station control.
- Cylinder and pump can be supplied separately.
- Please see selection table for determination of steering wheel revolutions.
- Axial plunger pumps with 7 plungers



- Stainless steel steering wheel shaft, extra strong for large steering wheels
- These steering systems are supplied complete with fittings for hydraulic tubes
- The cylinders are provided with bleed nipples which accept a quick-release coupling for rapid bleeding.
- The piston rod is made of stainless steel
- The cylinder is provided with a base plate with universal joint and a swivelling rod end, so that alignment mistakes can be absorbed.

Technical data cylinders						
	MT230	MT345	MT455	MT600	MT900	MT1200
Max torque at 35° rudder angle	2207 Nm (225 kgm)	3335 Nm (340 kgm)	4415 Nm (450 kgm)	5886 Nm (600 kgm)	8829 Nm (900 kgm)	11772 Nm (1200 kgm)
Cylinder stroke	200 mm	300 mm	400 mm	200 mm	300 mm	400 mm
Max. pressure	6178 kPa (63 kg/cm <sup>2</sup> ) (896 lbs/sq.inch)					
Cylinder volume	500 cm <sup>3</sup>	750 cm <sup>3</sup>	1000 cm <sup>3</sup>	1319cm <sup>3</sup>	1978 cm <sup>3</sup>	2638 cm <sup>3</sup>
Total rudder angle	70°					
Length of tiller arm	175 mm	260 mm	350 mm	175 mm	260 mm	350 mm
Weight of cylinder	13.8 kg	15.9 kg	18 kg	35.1 kg	38.8 kg	42.5 kg
Dimensions of tubes	Ø 18 x 15 mm					
Connections	All connections are provided with G ½ female pipe thread.					

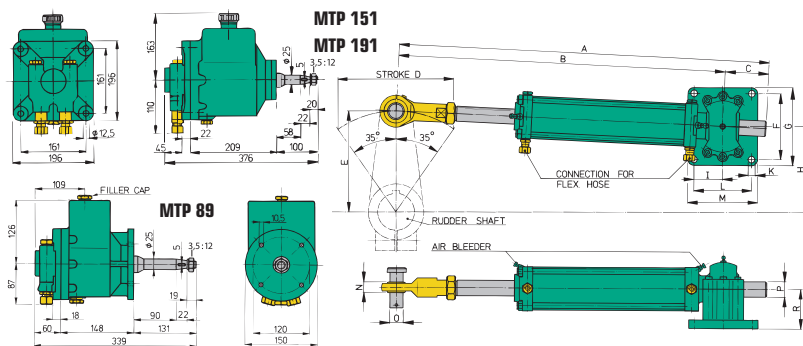
**These pump units and cylinders are fully interchangeable, thus enabling the builder and the owner to choose the best possible combination of price and number of steering wheel revolutions.**

**The smaller the pump unit, the lower the price, but also: the higher the number of revolutions. The rudder torque always determines which cylinder is to be selected.**

Technical data pump units			
	MTP 89	MTP 151	MTP 191
Capacity of pump unit	89 cm <sup>3</sup> /rev.	151 cm <sup>3</sup> /rev.	191 cm <sup>3</sup> /rev.
Number of pistons	7	7	7
Maximum pressure	63 kg/cm <sup>2</sup> (6178 kPa) (896 lbs/sq. inch)		
Dimensions of tubes	Ø 18 x 15 mm		
Connections	G ½ female pipe thread		
Weight of pump unit	9.1 kg	23 kg	23 kg
Min. Steering wheel diameter	65 cm	110 cm	135 cm

Pump unit	Cylinder					
	MT230	MT345	MT455	MT600	MT900	MT 1200
MTP89	5.6	8.4	11.2	14.8	22.2	29.6
MTP151	3.3	5.0	6,6	8.8	13.1	17.5
MTP191	2.6	3.9	5.2	6.9	10.4	13.8

Both for single and for dual steering, a non-return valve is available (complete with all fittings): a **single** non-return valve, complete with by-pass (HS74), or a **dual** non-return valve (HS81). Also a pressure relief valve, complete with all fittings, can be supplied (HS42).



Cylinder	A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	R
MT 230	733	607	127	200	175	112	140	143	36	11	72	100	31	25	28	55
MT 345	933	757	177	300	260	112	140	215	36	11	72	100	31	25	28	55
MT 455	1133	907	227	400	350	112	140	286	36	11	72	100	31	25	28	55
MT 600	735	695	40	200	175	160	198	143	71,5	18,5	143	182	25	35	40	102
MT 900	935	845	90	300	260	160	198	215	71,5	18,5	143	182	25	35	40	102
MT 1200	1135	995	140	400	350	160	198	286	71,5	18,5	143	182	25	35	40	102

## Reduction of the number of steering wheel revolutions

It is the hydraulic **cylinder** which determines the torque of a hydraulic steering system, whereas all steering pumps are in principle interchangeable. When a reduced number of steering wheel revolutions from starboard to port is required, a steering pump with **larger capacity** should be selected. It should be taken into account that the force to be applied to the steering wheel becomes relatively greater, possibly leading to the necessity of selecting a larger diameter steering wheel. As already stated, the cylinder determines the torque. The choice of the correct cylinder is determined by the rudder torque in Nm (or kgm). To the cylinder a pump unit must be applied (two pump units in case of a dual hydraulic steering), in conformity with the required number of steering wheel revolutions from port to starboard.

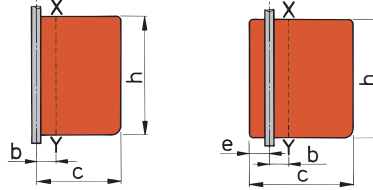
### HOW TO DETERMINE THE CORRECT VETUS HYDRAULIC STEERING?

The rudder torque is the determining factor (Torque = force x lever). To ascertain the correct rudder torque, only the maximum speed of the vessel, the surface area of the rudder blade and the maximum rudder angle (in degrees) are of importance. Information such as length of boat and engine power are irrelevant. With a few admitted exceptions, the rudder performs best with a maximum rudder angle of 35° to either side. Contrary to what is sometimes claimed for rudders with the "usual" dimensions, a larger rudder angle

does not enhance the manoeuvring capabilities of a vessel.

The formula to determine the rudder torque reads:

$M$  (torque) =  $F \times b$  (per rudder)  
 In other words: the force  $F$ , which is applied to the rudder (given in Newton = N), is being multiplied by the lever "b", being the distance between the centerline of the rudder stock and the centre of pressure which lies on the line X-Y.



Rudder without balance section Rudder with balance section

$F$  (the force applied to the central line XY) – taking into consideration a maximum rudder angle of 2 x 35° – is constituted in the following manner:  
 $F = 23.3 \times a \times v^2$  in Newton (N),  
 or:  $F = 2.33 \times A \times v^2$  in kgf.

$A$  = total surface area of rudder blade in m<sup>2</sup>.  
 $v$  = speed in km/hour.  
 A rudder **without** balance section requires the formula:  
 $b = 0.37 \times c$  (in metres);

A rudder **with** balance section calls for the formula:  
 $b = (0.37 \times c) - e$  (in metres).

### Calculation example of one rudder with balance section

the maximum speed of the boat is 16 km/hour ( $v$ );  
 the total width of the rudder blade is 57 cm ( $c$ );  
 the width of the balance section is 9 cm ( $e$ );  
 the height of the rudder blade is 100 cm ( $h$ ).

$$F = 23.3 \times 0.57 \times 1.00 \times 16^2 = 3400 \text{ N (340 kgf)}$$

$$b = (0.37 \times 0.57) - 0.09 = 0.12 \text{ m.}$$

Therefore, the rudder torque amounts to  $3400 \times 0.12 = 408 \text{ Nm (41 kgm)}$ . So, the VETUS hydraulic steering to be selected in this case is model MTC52. With a **twinn rudder** installation, the required torque is  $2 \times 408 \text{ Nm} = 816 \text{ Nm}$ , which makes model MTC125 the one to choose.

Because smaller vessels tend to respond quite sharply to the rudder commands, the maximum rudder torque is not used and a reduction of 10 to 20% off the calculated maximum torque is quite acceptable most of the time, especially if the boat is not sailed in heavy weather. Careful: some other manufacturers of hydraulic steerings have already taken such reduction into account when stating their capacity (torque). We, at VETUS, are of the opinion however, that the choice of whether or not such reduction should be applied, is exclusively the option of the naval architect.

### HHOSE



#### NYLON HOSE

Nylon hose Ø 6 x 8 mm, for cylinder MTC30, in rolls of 15 or 100 metres.

Nylon hose Ø 6 x 10 mm, for cylinders MTC52 - MTC175 in rolls of 15, 30, 50 and 100 metres.

Nylon hose Ø 8 x 12 mm, for cylinders MTC52 - MTC175 in rolls of 15, 30, 50 and 100 metres.

### COPPER



#### COPPER TUBING

Copper tubing available (per roll) in three different dimensions: Ø 6 x Ø 8, length 16 m. Ø 8 x Ø 10 mm, length 20 m, Ø 15 x Ø 18 mm, length 10 m.

### HF15



#### OIL

VETUS hydraulic oil. We supply suitable oil for all our VETUS hydraulic steerings in 2.5 ltr. cans.

### HS



#### NON-RETURN VALVE

The picture shows the separate dual non-return valve. In the case of a dual station system, a separate dual non-return valve or two single built-in non-return valves are required, in order to switch over automatically from one position to the other.

### BYPASS



#### BY-PASS VALVE

If, in an emergency, a quick change-over to tiller steering is required installation of a by-pass valve is necessary.

### HTPF



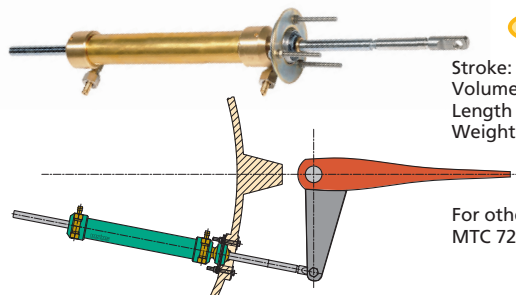
### HTPF2



This polished stainless steel flange can be used to fit a pump type HTP to replace an older type MTP pump. Flange type HTPF will recess the pump by 38 mm. Flange type HTPF2 will recess the pump by 74 mm. Both flanges come complete with a set of 4 stainless steel bolts, washers and nuts.

### HYDRAULIC STEERING SYSTEM FOR TRANSOM HUNG RUDDERS

#### MTC7210SL



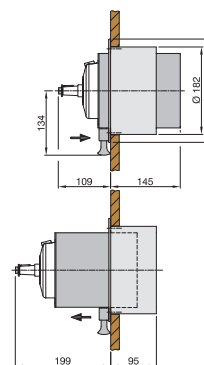
Stroke: 225 mm  
 Volume: 146 cm<sup>3</sup>  
 Length of rudder arm: 196 mm  
 Weight: 3 kg.

For other details see MTC 72, page 43.

### VETUS TELESCOPIC STEERING WHEEL ADJUSTER

For all hydraulic steering pumps, type HTP and HTPR, a telescopic steering wheel adjuster is available. This adjuster unit is fitted onto the steering pump and will greatly enhance the helmsman's steering comfort, both seated and standing. Maximum travel is 90 mm adjustable in 3 steps of 30 mm.

The adjuster unit is made of stainless steel AISI 316, with the visible parts high-gloss polished. Slide components are made of synthetic materials. The adjustment unit may be fitted internally at any angle between horizontal or vertical. For external applications, it should only be fitted horizontally. The correct steering pump should be ordered separately and must be connected with flexible hydraulic hoses, such as VETUS hose type HHOSE. Weight of adjuster unit: 4,6 kg.

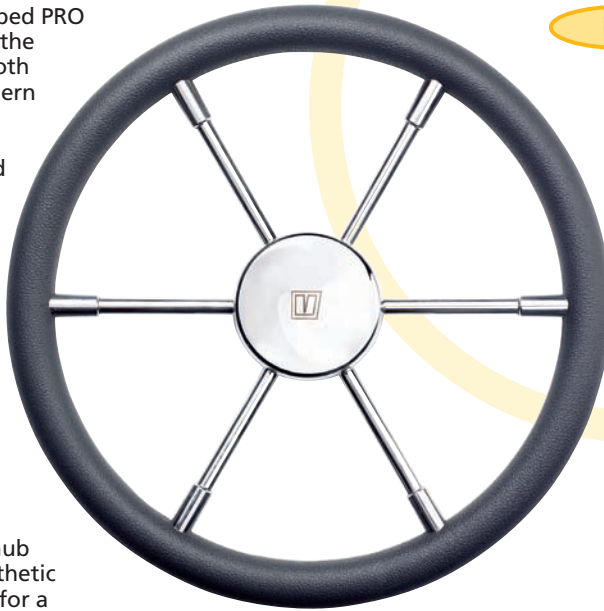


### HS1000

These newly developed PRO steering wheels are the perfect match for both traditional and modern boats.

Type "T" features a satin-gloss varnished **teak rim**. Type "P" is resistant against all possible weather conditions and the **semi-hard polyurethane rim** (RAL 7016) will keep your hands warm. The substantial spokes and the hub cover are made from high-gloss polished stainless steel. The hub itself is made of synthetic material and bored for a  $\text{Ø } \frac{3}{4}$ " shaft with 1:12 taper, so that it will fit most types of steering systems.

The outer rim measures 32 mm in diameter, ensuring a comfortable grip in all conditions. These steering wheels are available with overall diameters of 400, 500 or 600 mm. These steering wheels fulfil all CE and ABYC directives. An alternative hub is available as an option, to suit older VETUS steering pumps. This has a shaft hole of  $\text{Ø } 1$ " and a taper of  $3 \frac{1}{2} : 12$ . Product code: SETPS1.



PRO

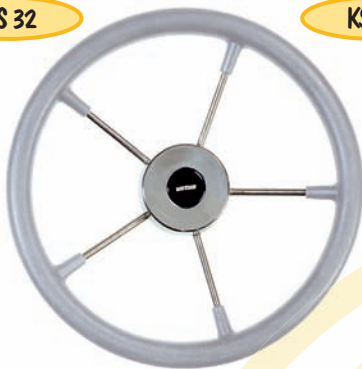
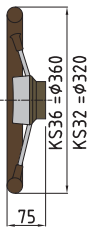


WITH TEAK RIM

VETUS steering wheels type KS feature stainless steel rims with a layer of **semi-hard PU-foam** which has an integral skin. Consequently **no more cold hands** with these soft-feel beautiful ship's wheels. Spokes and cap are stainless steel. These ship's wheels are absolutely resistant against all weather conditions. Type KS 38, KS 45 and KS 55 are supplied in the colours grey or black.

The boss of **all** VETUS steering wheels has a bore for  $\text{Ø } \frac{3}{4}$ " shaft, tapered 1:12 and will therefore fit to most steering systems.

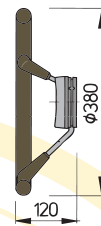
KS 32



KS 36

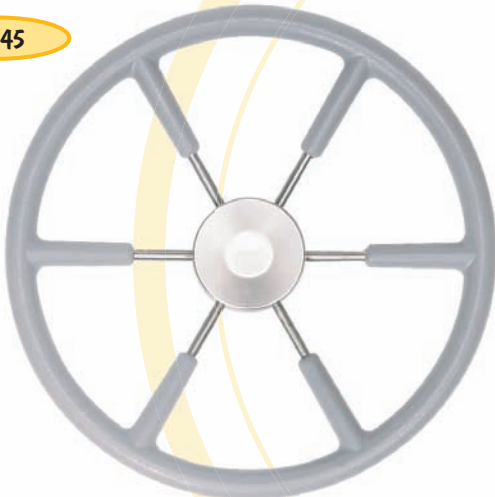
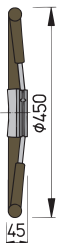


KS 38

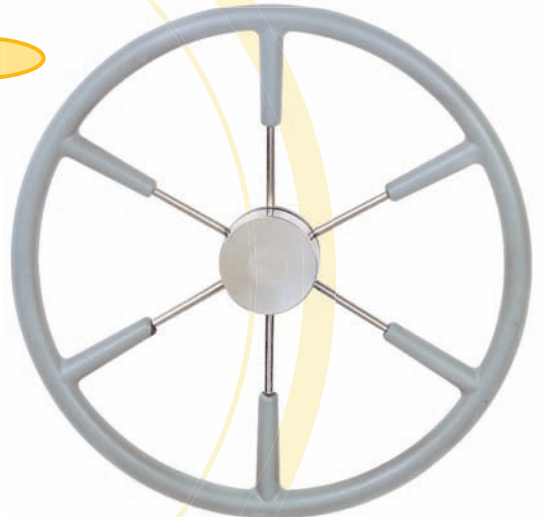
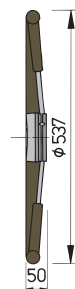


Steering wheel type KS 32 and KS 36, suitable for steering outboard motors with a maximum output of up to 40 kW (55hp).

KS 45

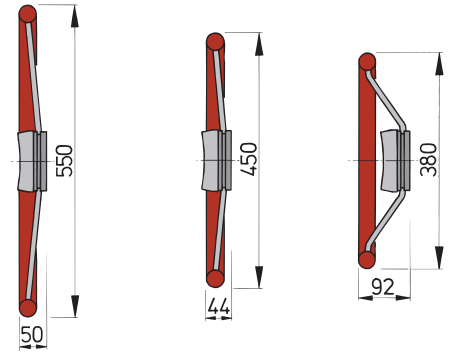
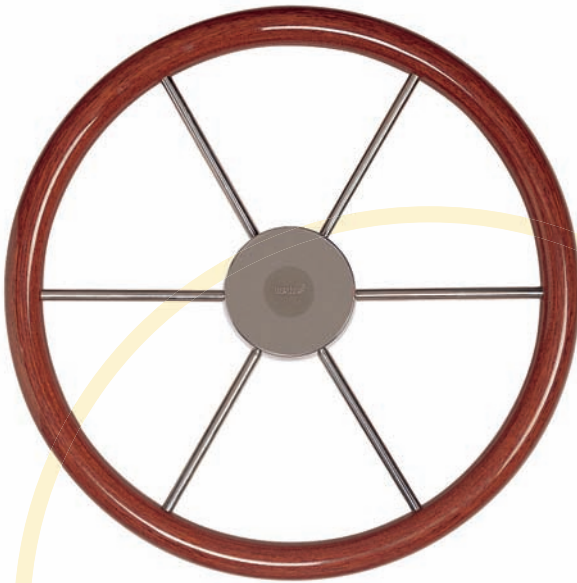


KS 55



The spokes and the hub cap are made of stainless steel; the hub is made of aluminium.

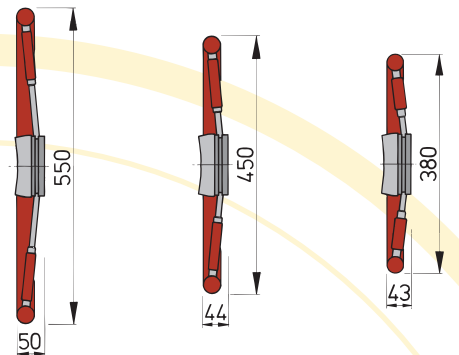
**WITH MAHOGANY RIM**



**KW 55** (Ø 550 mm)    **KW 45** (Ø 450 mm)    **KW 38** (Ø 380 mm)

The boss of **all** VETUS steering wheels has a bore for Ø 3/4" shaft, tapered 1:12 and will therefore fit to most steering systems.

**WITH MAHOGANY RIM AND SPOKES**



**KWL 55** (Ø 550 mm)    **KWL 45** (Ø 450 mm)    **KWL 38** (Ø 380 mm)

**VETUS STEERING WHEELS**

types KA, KB, KC are supplied without hub cap. A brass or stainless steel hub cap should be ordered separately (see price list).



**KC**

Overall diameter 300 mm, 420 mm, 520 mm



**KB**

with wooden hoop. Overall diameter 460 mm, 550 mm



**KA**

with stainless steel hoop. Overall diameter 440 mm, 550 mm, 630 mm

Steering wheel models KA, KB and KC are also available with a hub bored for ø 1" shaft and tapered 3 1/2:12. For steering wheel models KS38 to KS55 and for all wheels KW and KWL, a hub with ø 1" bore, tapered 3 1/2:12 is available as an option. Order code: SETKS1.

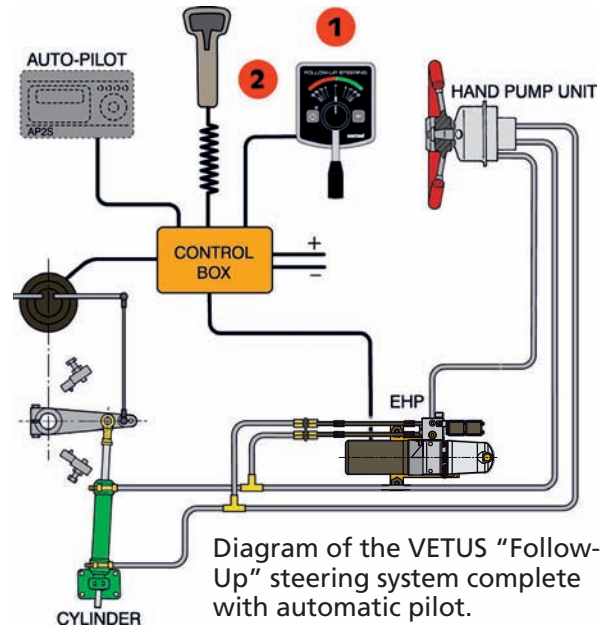


## "FOLLOW-UP" STEERING SYSTEM

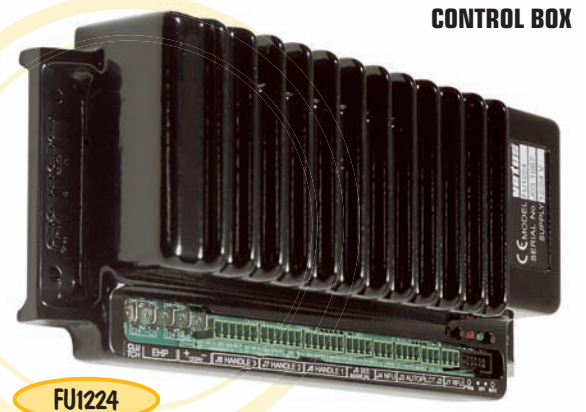
The VETUS "Follow-Up" steering system has been derived from a type of steering that is in common use with professional inland waterways vessels. Because many pleasure craft are already equipped with a manual hydraulic steering system, this VETUS "Follow-Up" steering system can be easily added to enable remote control from any convenient position on board. By simply turning the steering handle, the rudder will exactly follow the angle of the handle. Returning the handle to the mid position will also return the rudder to midships. Manual wheel steering can be resumed at any time by simply switching the system off. In principle, the VETUS "Follow-Up" steering system is suitable for boats of 6 - 20 metres LOA.



The fixed "follow up" control handle shown here, can operate any type of hydraulic steering system fitted with an electro-hydraulic pump, by means of the control box (see drawing). It may be mounted on the dashboard, or fixed to the helmsman's seat, for example. This type of remote control may be used as the main steering device (instead of a steering wheel), or as a secondary or even third steering option.



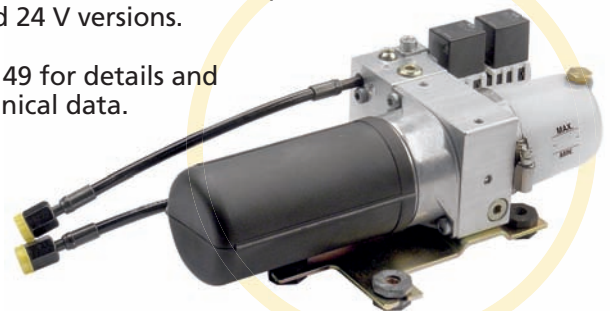
This hand held "follow-up" control has the same function as the fixed control handle shown above. The control is supplied with a 3m spiralled cable with connection plug and socket. The mobile hand held control can only be used in addition to the fixed control.



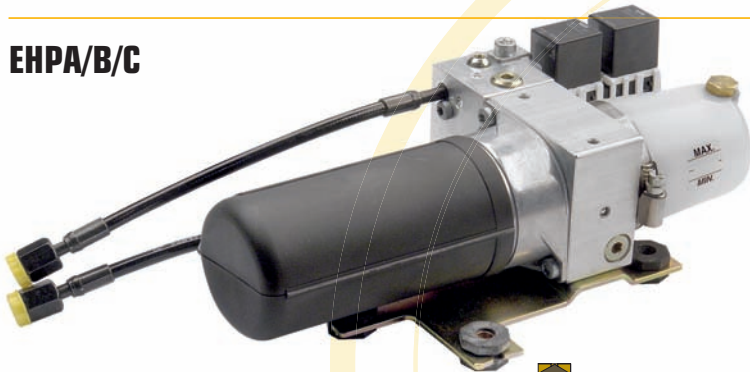
The VETUS "follow-up" steering system consists of: a fixed remote control handle, a control box, a rudder feedback unit and an electro-hydraulic pump. In addition to the fixed remote control handle, two more fixed or hand held remote controls can also be connected to the control box. The control box will operate an electro-hydraulic pump (EHP) with a reversible motor and a maximum power consumption of 20 A, or an EHP unit equipped with solenoid valves. The control box is suitable for both 12 V and 24 V power supply.

Depending on the volume of the hydraulic steering cylinder and the required steering time from hard over to hard over, there are a number of EHP's to choose from, available in both 12 V and 24 V versions.

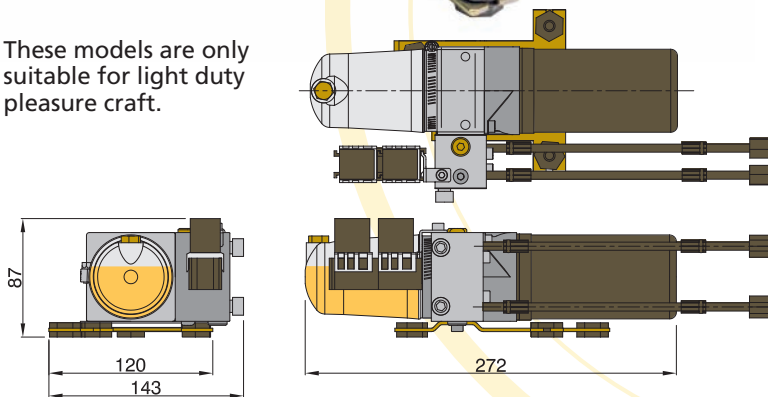
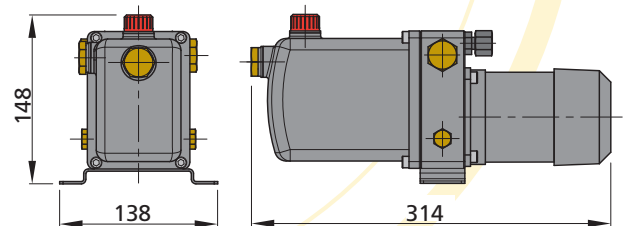
Please see page 49 for details and all relevant technical data.



A VETUS electro-hydraulic pump (EHP) consists of a reversible electric motor, an oil pump, built-in pressure relief valves and a small reservoir for the hydraulic oil. Models EHPA, EHPB and EHPC are provided with an axial plunger pump, with integrated non-return valves and a by-pass valve. Models EHPD and EHPE feature a gear type pump with integrated non-return valves and a by-pass valve. The direction of rotation of the pump is electrically controlled.

**EHPA/B/C**


These models are only suitable for light duty pleasure craft.


**EHPD/E**


A VETUS EHP is a truly versatile piece of equipment. It can be used with "non Follow-Up" steering systems, with joystick control and/or electric remote control (see page 50), with "Follow-Up" steering systems, hatch lifters, etc. etc.

**There is a choice of 5 EHP models:**

EHPAR2	with a capacity of	350 cm <sup>3</sup> /min.	17,1 sec/100 cm <sup>3</sup>
EHPBR2	with a capacity of	700 cm <sup>3</sup> /min.	8,5 sec/100 cm <sup>3</sup>
EHPCR2	with a capacity of	950 cm <sup>3</sup> /min.	6,3 sec/100 cm <sup>3</sup>
EHPD	with a capacity of	1425 cm <sup>3</sup> /min.	4,3 sec/100 cm <sup>3</sup>
EHPE	with a capacity of	1900 cm <sup>3</sup> /min.	3,1 sec/100 cm <sup>3</sup>

**Pressure relief valve settings:**

40 bar for models EHPAR2 – EHPCR2

70 bar for models EHPD and EHPE

**Reservoir capacity:**

0.2 litres for models EHPAR2 – EHPCR2

0.95 litres for models EHPD and EHPE

**Relays:**

Integral and pre-wired for models EHPAR2 – EHPCR2

A double pole relay BP94 (12 Volt) or BP1360 (24 Volt) should be ordered separately for models EHPD and EHPE.

**Current consumption:**

EHPAR2	12 Volt	6,5 - 12 A
EHPBR2	12 Volt	7,5 - 13,5 A
EHPCR2	12 Volt	10 - 15 A
EHPD	12 Volt	16 A
EHPE	12 Volt	22 A

EHPAR2	24 Volt	5 - 6,5 A
EHPBR2	24 Volt	5,5 - 7 A
EHPCR2	24 Volt	5,7 - 10 A
EHPD	24 Volt	9 A
EHPE	24 Volt	11 A

Models EHPAR, EHPBR and EHPCR are supplied **without** hose fittings. Sets for ø 8 mm tubing (MTC30) and ø 10 mm tubing (MTC52 - MTC175 and OBC125 - OBC275) are available separately. Models EHPD and EHPE have ø 10 mm pipe fittings as standard supply.

**SELECTION OF THE HARD OVER TO HARD OVER TIME FOR THE CYLINDER, IN COMBINATION WITH AN EHP**

When used in combination with an automatic pilot, consult the instruction manual to select the desired hard over to hard over time. In most cases this will be between 7 and 23 seconds.

In the case of a remote steering system, either with a joystick or as a "Follow-Up" assembly, we recommend a cylinder hard over to hard over time of between 7 and 11 seconds.

Example: Cylinder MTC 72 has a capacity of 146 cm<sup>3</sup> and a required hard over to hard over time of 20 seconds:

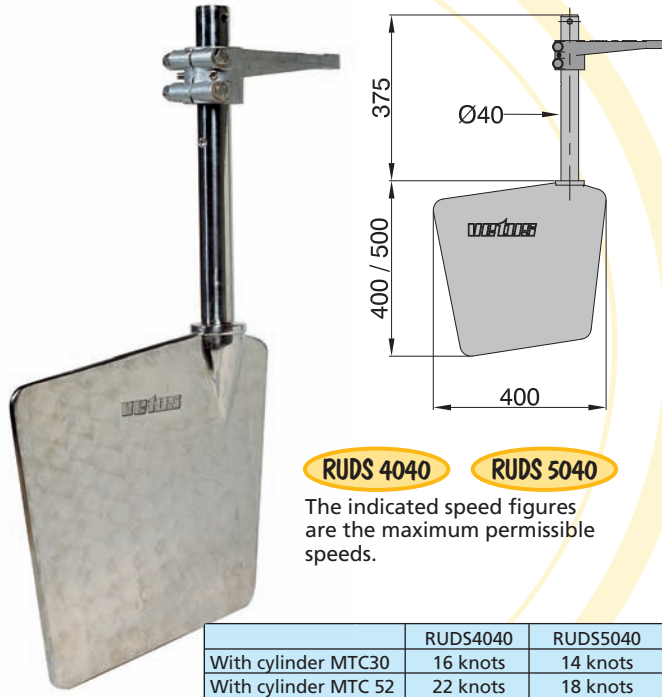
- Using model EHPAR the hard over to hard over time is 1.46 x 17.1 sec. = 25 seconds,

- Using model EHPBR the hard over to hard over time is 1.46 x 8 sec. = 12.4 seconds.

Therefore, model EHPBR should be selected.

## RUDDERS MADE OF STAINLESS STEEL (AISI 316)

These VETUS rudders have a blade made of stainless steel. They are manufactured in two different models. The blade sides are polished and need no additional finishing. Each rudder comes complete with a rudder arm (see picture), to which a VETUS hydraulic steering cylinder can be connected. **A RUDDER GLAND (TYPE HENKO ONLY) MAY BE SUPPLIED AS AN EXTRA.** The stainless steel rudder stock is provided with a hole, to facilitate the fitting of an emergency tiller.



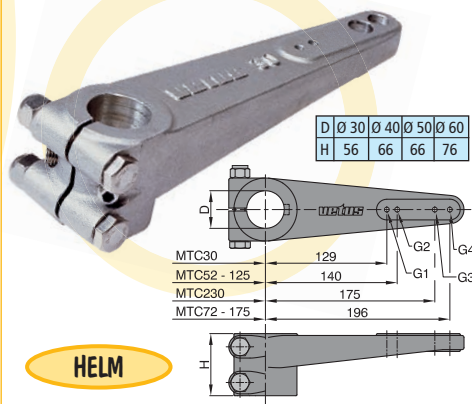
**RUDS 4040**      **RUDS 5040**

The indicated speed figures are the maximum permissible speeds.

	RUDS4040	RUDS5040
With cylinder MTC30	16 knots	14 knots
With cylinder MTC 52	22 knots	18 knots

## ALUMINIUM RUDDER ARMS

These rudder arms are available for rudder stocks of  $\varnothing$  30, 40, 50 or 60 mm. Connection to the rudder stock is made by two clamp bolts. The  $\varnothing$  30 and 40 mm rudder arms also have two locking grub screws onto the shaft and feature 4 attachment points for the steering cylinder. This makes them suitable for VETUS hydraulic cylinders MTC30, MTC52 and MTC72. The  $\varnothing$  50 and 60 mm rudder arms have a stainless steel key (standard supply) and feature 3 attachment points, which match VETUS hydraulic cylinders MTC125, MTC175 and MT230. For connecting VETUS cylinder types MTC30 - MTC175, matching bolt sets are available as an option. See pricelist.

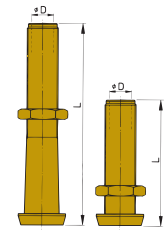


**HELM**

## RUDDER GLAND



Bronze rudder gland for  $\varnothing$  30 or  $\varnothing$  40 mm rudder stocks. Available with 2 different lengths.

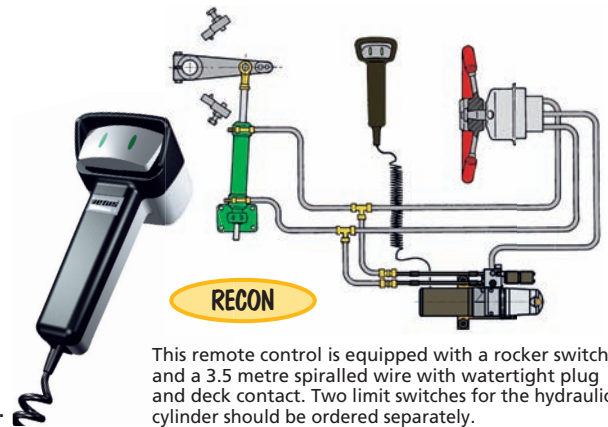


D	L
Ø 30	175
Ø 30L	275
Ø 40	205
Ø 40L	305

## ELECTRIC REMOTE CONTROL STEERING

Conventional wheel operated hydraulic steering systems can now be equipped simply and cheaply with an electrically operated remote control unit. With this unit the boat may be steered from virtually any point on board. A VETUS electro hydraulic pump, model EHPAR2, EHPBR2, EHPCR2, EHPD or EHPE is fitted in the hydraulic system (see diagram) and connected to the DC power supply. A hand held remote control,

supplied with a spiralled wire, is then used to operate the pump in the required direction. The following components are to be ordered separately (see price list): Electrohydraulic pump, model EHPAR2, EHPBR2, EHPCR2, EHPD or EHPE (see page 49). Hydraulic fitting set for pump. Hydraulic tubing of the required length. One or more hand held controls with spiralled wire. Two limit switches for the hydraulic cylinder.



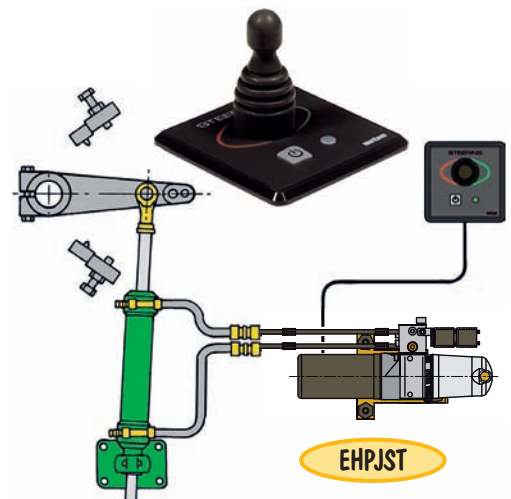
**RECON**

This remote control is equipped with a rocker switch and a 3.5 metre spiralled wire with watertight plug and deck contact. Two limit switches for the hydraulic cylinder should be ordered separately.

## JOYSTICK STEERING

The main steering position of many new inland waterways vessels nowadays, features a joystick steering device. This joystick and its associated electro-hydraulic pump replaces the normal wheel operated steering pump. The hydraulic steering cylinder must as always be specified according to the rudder torque. For VETUS hydraulic cylinders, please see page 43.

For a VETUS joystick steering system the following components are to be ordered separately (see price list): Electro-hydraulic pump, model EHPAR2, EHPBR2, EHPCR2, EHPD or EHPE (see page 49). Hydraulic fitting set for pump. A hydraulic steering cylinder; for example one of the VETUS models MTC30 - MTC175. Hydraulic tubing of the required length. A panel with joystick control. Two limit switches.



**EHPJST**

## FOR LIFTING ENGINE ROOM HATCHES, MASTS, ETC.

This electro-hydraulic lifting system makes opening a heavy hatch or lowering a mast or radar arch an easy affair. If necessary, two cylinders may be connected to one pump, to generate even more lifting power. The system is "stand alone" and is supplied complete with all required connection parts, as well as a waterproof control panel. It is also possible to fit a remote control as an option.

**The standard system consists of:** a seawater-resistant aluminum cylinder with a stainless steel rod, an electro-hydraulic pump, a waterproof control panel, 12 metres of hydraulic piping, and all required hose connectors. If two 320 kgf cylinders are installed, it is necessary to install an additional oil reservoir. This is available as an option, code HTANK and fitting kit SLP7/1620.

Code	Description	Voltage	Stroke	Lifting power
HL12500A	Complete system	12 Volt	500 mm	125 kgf
HL24500A	Complete system	24 Volt	500 mm	125 kgf
HL12500B	Complete system	12 Volt	500 mm	320 kgf
HL24500B	Complete system	24 Volt	500 mm	320 kgf
HL500	Additional cylinder		500 mm	125 kgf
HL500 B	Additional cylinder		500 mm	320 kgf

In order to calculate the required lifting power (F), the following data must be taken into consideration:

W = Width of the object to be lifted (e.g. 1300 mm)

G = Weight of the object to be lifted (e.g. 90 kg)

S = Stroke of the piston in mm

F = Required lifting power in kgf

### THE FORMULA THEN WORKS AS FOLLOWS:

$$F = \frac{1}{2} W \times \frac{G}{S}$$

### EXAMPLE:

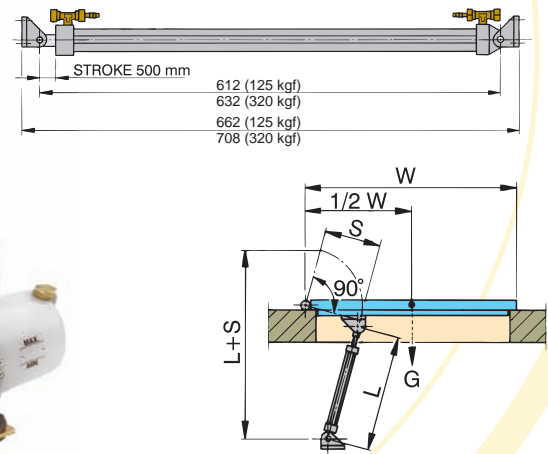
$$\frac{1}{2} \times \frac{1300 \times 90}{500} = 117 \text{ kgf}$$

In this case, system HL12500A featuring one cylinder with a lifting power of 125 kgf will be sufficient.

If two cylinders must be installed an additional connection kit will be required; please see price-list. Hydraulic fluid must be always ordered separately.



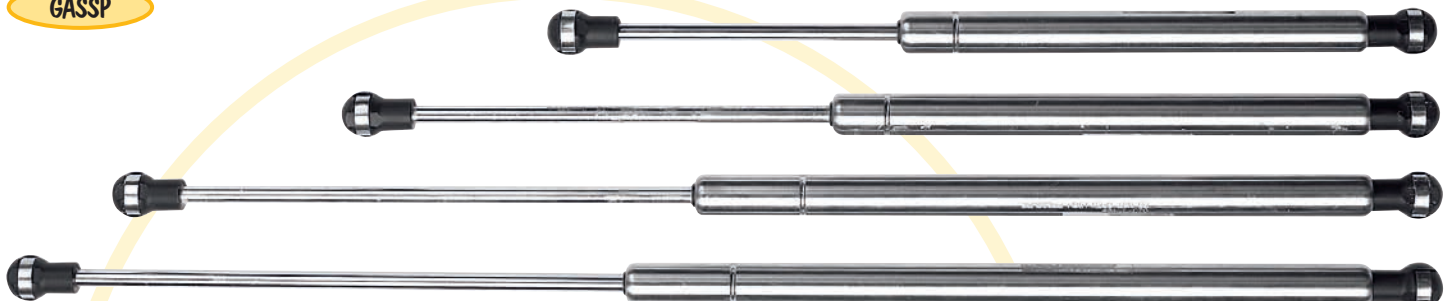
**HYLIFT (HL)**



## GAS STRUTS

There are many applications on board where the assistance of a gas strut will reduce the effort required. For example, heavy deck hatches or locker doors. VETUS gas struts have been specifically designed for marine use. All external parts are made of stainless steel (AISI 316) and the special seals guarantee long service life. The gas-filled cylinders are supplied complete with fastening materials.

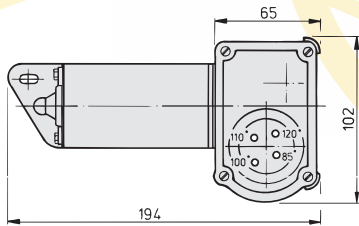
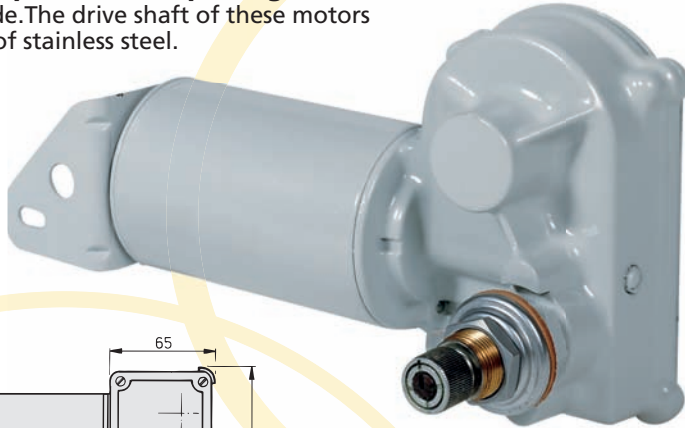
**GASSP**



Top quality marine wipers, which meet all the demands of a boat windscreen wiper. They feature a powerful motor **and a separate housing with worm wheel transmission**. Extremely quiet in operation. Highly suitable for all kinds of boats. Available in 12 V (4 A) or 24 V (2.1 A). The wiping angle may be adjusted to 85°, 100°, 110° or 120°. Standard setting at 110°. When ordering, please specify: voltage and drive shaft length (see drawing). • The wiper blade and the wiper arm are to be ordered separately.

These VETUS wiper motors (Type RWS) are **two-speed and self-parking** on either side. The drive shaft of these motors is made of stainless steel.

**RWS**

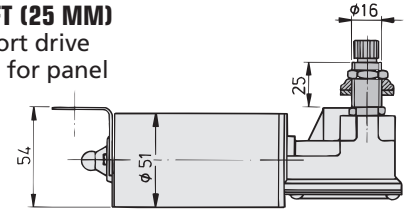


(2-speed and self-parking)

## THESE VETUS WIPER MOTORS MAY BE SUPPLIED WITH A SHORT OR A LONG DRIVE SHAFT

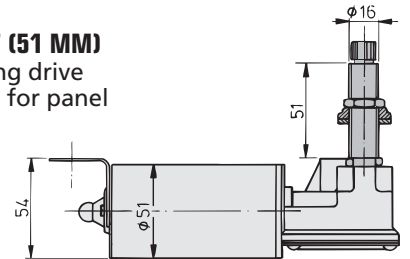
### SHORT DRIVE SHAFT (25 MM)

Motors with a short drive shaft are suitable for panel thicknesses from 3 mm to 13 mm.



### LONG DRIVE SHAFT (51 MM)

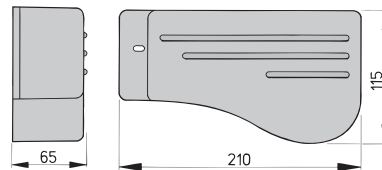
Motors with a long drive shaft are suitable for panel thicknesses from 3 mm to 38 mm.



## PLASTIC COVER FOR VETUS WIPER MOTOR TYPE RWS COMPLETE WITH BOTTOM PLATE

**RWCG**

Installation of the plastic cover reduces the indicated maximum panel thickness by 3 mm. When using the wiper arm type AD, the maximum panel thickness is reduced by 6 mm and with the arm type SSAD by 3 mm.



**WBS**

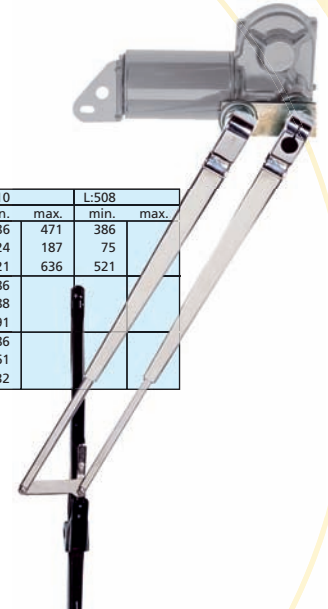
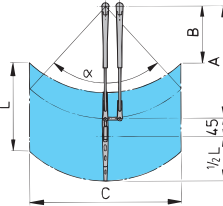
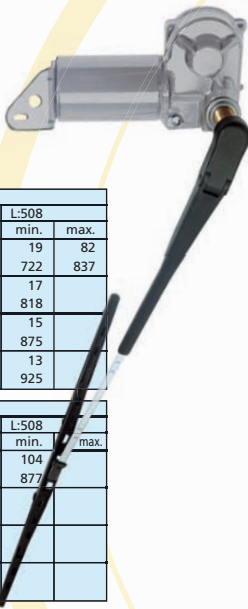
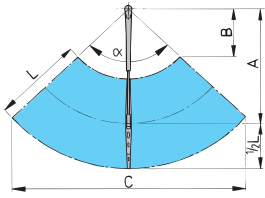
The wiper blades are available in the lengths 305 mm, 410 mm or 508 mm. The metal parts of the blades are made of stainless steel, either high-gloss polished or coated black. These blades are separately available and will fit **almost all makes and types of wiper arms with a tang of 7.2 x 2.5 mm**.



**WBB**



From the combinations shown below the desired wiping angle for practically any window can be found.

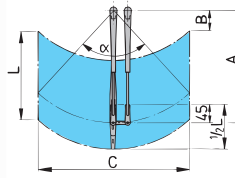


		A: min. 280		max. 366			
α		L:305 Min.	max.	L:410 min.	max.	L:508 min.	max.
85°	B:	94	157	55	118	19	82
	C:	584	700	655	771	722	837
100°	B:	82	137	48	103	17	
	C:	663	794	743	874	818	
110°	B:	73	122	43	92	15	
	C:	709	849	795	935	875	
120°	B:	64	107	38		13	
	C:	749	897	840		925	

		L:305		L:410		L:508	
α		Min.	max.	min.	max.	min.	max.
85°	A:	308	393	308	393	308	393
	B:	119	182	67	130	18	81
	C:	415	531	415	531	415	531
100°	A:	308	393	308	393	325	
	B:	90	145	38	93	0	
	C:	471	602	471	602	498	
110°	A:	308	393	308	393		
	B:	69	118	16	65		
	C:	504	644	504	644		

		L:305		L:410		L:508	
α		Min.	max.	min.	max.	min.	max.
85°	A:	386	471	386	471	386	471
	B:	177	240	124	187	75	386
	C:	521	636	521	636	521	636
100°	A:	386	471	386			
	B:	140	195	88			
	C:	591	722	591			
110°	A:	386	471	386			
	B:	114	163	61			
	C:	632	772	632			

		A: min. 395		max. 481			
α		L:305 Min.	max.	L:410 min.	max.	L:508 min.	max.
85°	B:	179	242	140	203	104	
	C:	740	855	811	926	877	
100°	B:	156	211	122			
	C:	839	970	919			
110°	B:	139	188	109			
	C:	897	1037	983			
120°	B:	121	164				
	C:	948	1096				



		L:305		L:410		L:508	
α		Min.	max.	min.	max.	min.	max.
85°	A:	308	393	339	393		
	B:	29	92	0	40		
	C:	415	531	458	531		
100°	A:	308	393	389	393		
	B:	1	55	0	3		
	C:	471	602	596	602		
110°	A:	344	393				
	B:	0	28				
	C:	564	644				

		L:305		L:410		L:508	
α		Min.	max.	min.	max.	min.	max.
85°	A:	386	471	386	471	405	
	B:	87	150	34	97	0	
	C:	521	636	521	636	547	
100°	A:	386	471	388			
	B:	50	105	0			
	C:	591	722	594			
110°	A:	386	471				
	B:	24	73				
	C:	632	772				

The **metal parts** of these wiper arms are made of **high-gloss polished stainless steel (AISI 316)** and the black components are made of top-grade synthetic materials. The adjustable single wiper arms are available in 3 sizes:

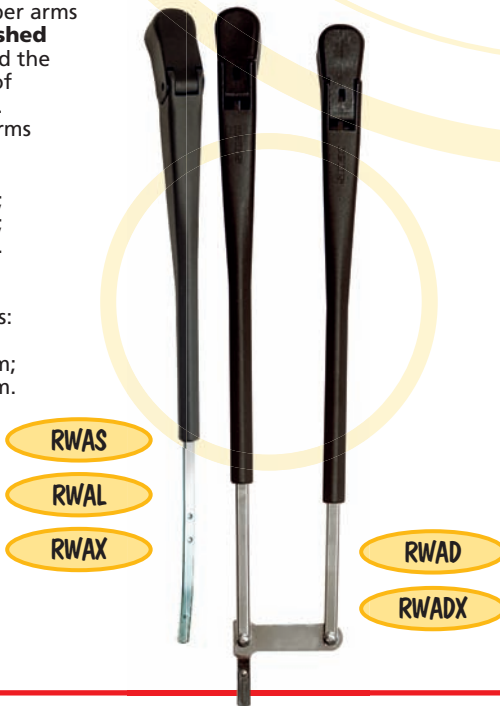
AS: from 280 mm to 366 mm;  
 AL: from 395 mm to 481 mm;  
 AX: from 473 mm to 559 mm.

The adjustable dual wiper arms are available in two sizes:

AD: from 308 mm to 393 mm;  
 ADX: from 386 mm to 471 mm.

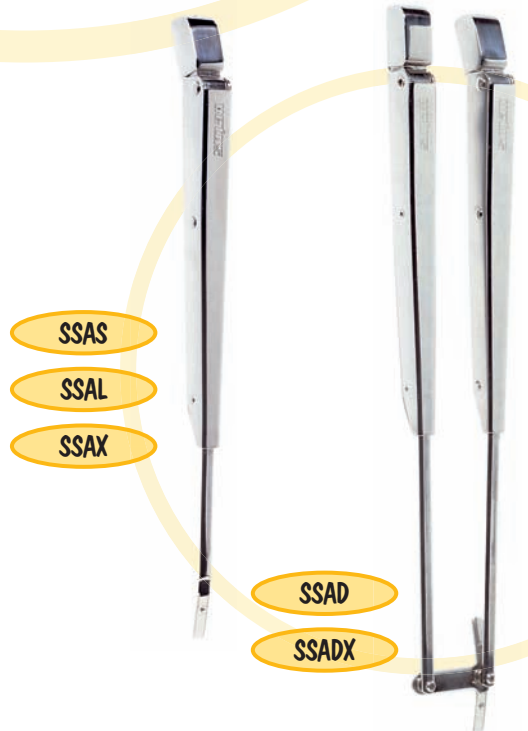
Wiper blades may be fitted in one of two positions on the dual wiper arms, so that the wiped surface can be adjusted.

The dual wiper arm spindle centres are 45 mm.



**STAINLESS STEEL WIPER ARMS.**

For boats that are used extensively in salt water, we recommend our VETUS wiper arms made entirely of **stainless steel (AISI 316)**.



These arms have the same dimensions as VETUS models AS-AL-AX- AD and ADX.

**Suitable combination of arm, blade and wiping angle.**

In order not to overload the RWS type wiper motor, it must be checked that the combination of arm length, blade length and wiping angle is acceptable.

The result of the sum: wiper blade length (mm) x arm length (mm) x wiping angle in degrees should not exceed **17,800,000**.  
 Example: Blade length: 410 mm  
 Arm length: 366 mm  
 Wiping angle: 120°  
 410 x 366 x 120 = 18,007,200  
 Therefore this combination is not allowed.

## WINDSCREEN WIPER CONTROL PANEL



W PANEL

If multiple windscreen wipers are installed this VETUS control panel allows up to 5 wiper motors to run synchronously, at either high or low speed. Each wiper motor is individually switched, so it is possible to select which wipers are operational. The wiper motors to be connected must have 2 speeds and an automatic parking position. The device also features a combination switch for the functions:

- Screen wash/wipe activation
- Speed selection and interval wipe delay.

Pressing the switch one way will start the wash/wipe function for all operational wipers. Pressing the switch the other way will select the wiper speed or one of five interval delays for all operational wipers. A LED on the panel indicates which interval position has been selected.

The control panel is supplied complete with the following components: 1 control unit, 5 wiper motor switches, 1 combined switch for wash/wipe and speed selection, 1 mounting plate with locations for 6 switches and 2 blind plates. The panel is completely pre-wired. The control unit has electronic overload protection and can be DIN rail mounted.

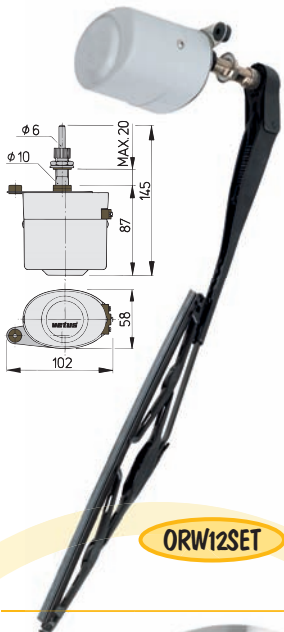
**Technical data:**  
 Voltage: 12 and 24 Volt D.C.  
 Power consumption, stand-by: approx. 10 mA  
 Maximum power per wiper motor: 120 W  
 Internal fuses: 10A each wiper motor, 5 A for screen wash pump or solenoid valve.  
 Dimensions :  
 Control panel: 160 x 90 x 60 mm

**Option**  
 Up to 3 VETUS rain sensors, type MARBO, can be connected to the control unit. The rain sensor function is activated using the supplied switch panel. With one single rain sensor fitted, it is possible to activate all five wipers simultaneously. Alternatively, sensor 1 activates one wiper motor, sensor 2 activates three wiper motors and sensor 3 activates one wiper motor. The rain sensor kit consists of a rain sensor and switch panel.



## WIPERS ORW FOR SMALL CRAFT

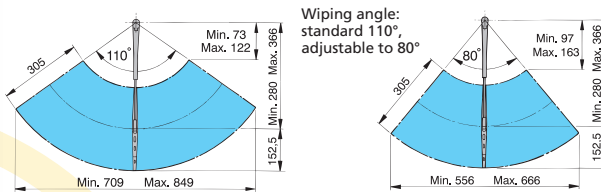
This VETUS windscreen wiper, model ORW, is only available as a complete assembly comprising motor, arm and blade.



The wiper blade type ORW12BL: is made of black plastic and is available as a spare part. It also fits other makes of wiper arms with a spade connector of 7.2 x 2.5 mm

**Technical details:**

- Electrical supply: 12 Volt DC
- Maximum current consumption: 2 A
- Length of drive shaft : 63,5 mm
- Maximum panel thickness: 20 mm
- Single speed and self parking
- Wiping angle : 80° or 110° (standard setting)
- Wiper arm length adjustable from 280 mm to 366 mm
- Blade length, ORW12BL: 305 mm



## WINDSCREEN WIPER CONTROL PANEL



RW PANEL

If two or three wipers motors are installed, this control panel enables two or three wipers to operate **synchronously** at normal speed. An interval wipe feature, with three different settings and a wash/wipe function are also built in. Two or three wiper motors may be connected to this panel and these must be two-speed and self-parking, such as VETUS models RWS and HDM. There is no need to install separate switches for the motors or windscreen washer. The panel is suitable for 12 and 24 Volt electrical installations and for wiper motors with a power consumption up to 10 A maximum each. The panel is protected against overload. Dimensions: 94 x 94 x 15 mm high, with a built-in depth of 30 mm.

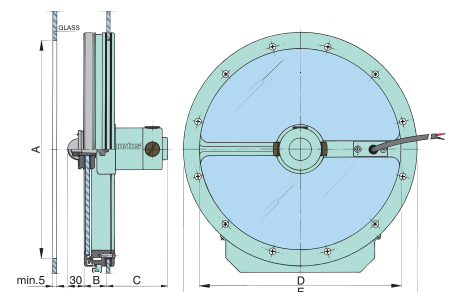
## CLEAR VIEW SCREENS

The toughened glass rotating screen reaches its maximum r.p.m. within 25 seconds. The centrifugal force enables all rain, snow and spray to be cleared instantly from the screen. Also dirt and salt will not cause any smears. As a result, your vision will remain completely clear. Available in 2 sizes and in 12 Volt or 24 Volt D.C. Type 300 and type 350: 12 Volt max. 2,7 A (24 Volt max. 1,4 A). As an option, these clear view screens may be equipped with a heating element.

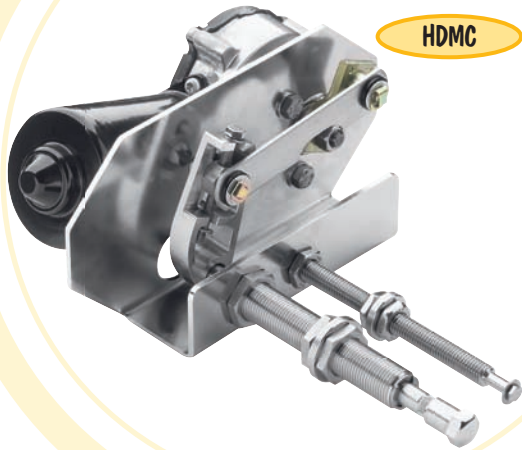


	A	B	C	D	E
Type 300	275	30	138	250	300
Type 350	327	37	134	300	350

SLR



## WINDSCREEN WIPERS WITH PARALLEL WIPER ARMS (HEAVY DUTY)



HDMC

### STAINLESS STEEL WIPER ARMS AND BLADES (AISI 316)

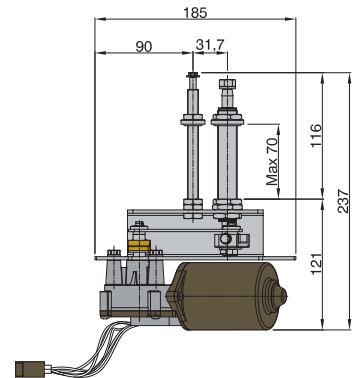
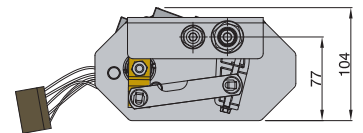
The wiper arms (SHDA) which fit the HDMC wiper motors, are supplied as **standard** in stainless steel (AISI 316). They are available in lengths of 508 or 762 mm. The matching wiper blade (model WB) has a length of 660 mm.

#### HDMC:

- extremely quiet.
- available in 12 or 24 Volt D.C.
- power: 75 Watt
- wiping angle fully adjustable between 62° and 92°
- self-parking on either side
- suited for panel thickness of up to 70 mm
- weight without arm and blade: 2,5 kg
- VETUS windscreen wiper model HDMC is interchangeable with previous models HDM, HDMA and HDMB.
- All visible parts of the mechanism are made of stainless steel.

#### HDMC WINDSCREEN WIPER

This windscreen wiper has a thermal cut-out, which will protect the electric motor in the event of excessive operating temperature.



#### ARMS AND BLADE

- parallel-system
- length of arms: 508 mm Type SHDA 500 and 762 mm Type SHDA 760
- length of blade: 660 mm
- WBS66: stainless steel, polished
- WBB66: stainless steel, black

The wiping angle of this wiper is **fully** adjustable between 62° and 92°, by virtue of which the optimum wiping surface may be determined for each specific window size. All components of these wipers are made of corrosion-proof materials, thus ensuring long-life and trouble-free service.

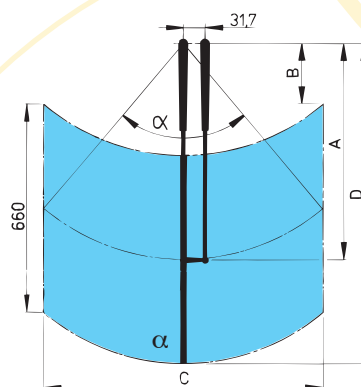
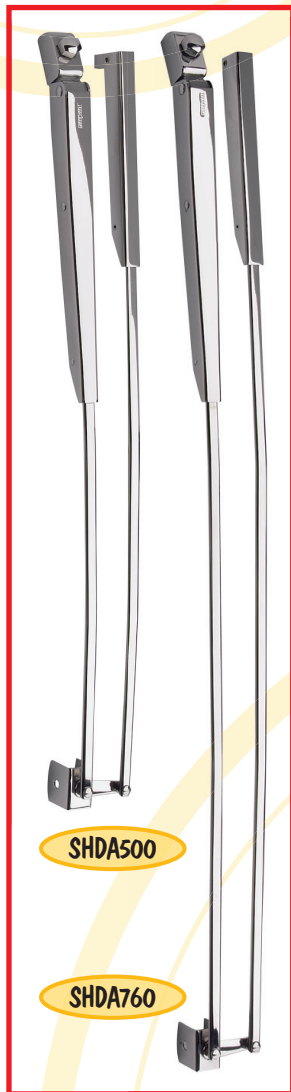


Table of wiping surface of the model HDM wipers

$\alpha$	$\alpha$ 62° - 92°
A: 508	B: 105 - 23
D: 838	C: 523 - 731
A: 762	B: 323 - 199
D: 1092	C: 785 - 1096



### SCREENWASHER

#### SUITABLE FOR ALL VETUS WIPER MODELS

- available in 12 or 24 Volt
- easy installation
- comes complete with: hose, solenoid valve (12 or 24 Volt D.C.), hose pillars, switch for solenoid, spray nozzles and skin-fittings.
- Supplied by domestic pressurized water system



### THREE-POSITION SWITCH (OFF,1,2) FOR ONE WIPER MOTOR

Type HDMSW, for two-speed wiper motors. Suitable for wiper motor RWS and HDM. Not suitable for model ORW.

HDMSW





All parts of these VETUS boat seats are made of seawater resistant anodised aluminium or high-grade plastics. The covers are made of top-quality UV resistant vinyl. The seat legs are supplied separately.



### CAPTAIN

The body of this seat is made of synthetic material and is very economically priced. The removable cushions are included as standard.

### ADMIRAL

This ergonomically shaped seat features a lifting seat base, so that a comfortable standing position can be achieved when manoeuvring.

### COMMODORE

This seat is generously proportioned and includes two arm rests.

## SEAT LEGS

All seat legs shown here, have a rotating and sliding seat mounting as standard. Sliding mechanism, track adjustable over 24 cm. The tubing is made of anodised aluminium. The base and clamp ring have a high quality polyurethane coating.

#### ADJUSTABLE SEAT LEG WITH GAS-FILLED CYLINDER

Robust construction.  
Adjustable between 43-58 cm  
Tube diameter: 10 cm.  
Base diameter: 352 x 295 mm



#### FIXED SEAT LEG

Available with 4 different heights: 40, 50, 60 or 70 cm.  
Tube diameter: 80 mm.  
Base diameter: 300 mm.



#### ADJUSTABLE SEAT LEG

Available in two sizes:  
- adjustable between 35 and 70 cm. This version requires 27 cm clearance under the floor.  
- adjustable between 38 and 63 cm.

Base diameter: 300 mm.



#### ADJUSTABLE SEAT LEG WITH GAS-FILLED CYLINDER

Adjustable between 44 and 55 cm.  
Base diameter: 300 mm.



#### ADJUSTABLE TABLE LEG

Complete with fixing plate for table top. Adjustable between 36 and 69 cm.

This leg requires 27 cm clearance under the floor.



This range of VETUS boat seats is aimed at the top end of the market. The solid construction of these seats is combined with the ultimate in comfort.



**PRESIDENT**

A luxurious seat at an affordable price. The backrest is adjustable 76 - 56 degrees and the arm rests can be lifted.



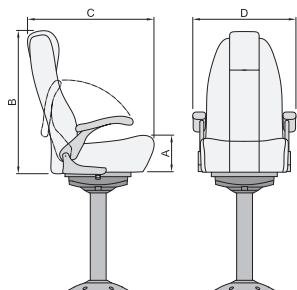
**CARIBBEAN**


The seat base is continuously adjustable and can be lifted. The backrest is adjustable 94 - 63 degrees and the arm rests can be lifted.



**ATLANTIC**

A generously proportioned and very comfortable helmsman's seat. Both the seat base and backrest are adjustable 94 - 63 degrees. The seat base and arm rests can be lifted.



 All seats shown on this page are available in the colours off-white or navy blue.

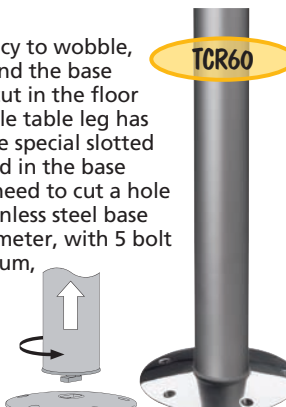
Boat seats	Captain	Admiral	Commodore	President	Caribbean	Atlantic
Dimensions in mm						
A	110	160	100	170	130	150
B	530	520	450	860	810	870
C	520	640	560	570	520	560
D	540	580	650	590	600	640

**ADJUSTABLE AND REVOLVING FOOT REST**  
Fits all VETUS adjustable seat legs.




**REMOVABLE TABLE LEG TYPE TCR60**

Removable table legs often have a tendency to wobble, due to play at the joint between the leg and the base plate. In addition, a hole must usually be cut in the floor to fit the base. The VETUS TCR60 removable table leg has none of these disadvantages. Owing to the special slotted joint, the leg and table will stand rock-solid in the base plate with no play at all and without the need to cut a hole in the floor. The TCR60 table leg has a stainless steel base plate, just 11 mm high and 150 mm in diameter, with 5 bolt holes. The leg is made of anodised aluminium, has a length of 60 cm and a stainless steel joint construction. The top of the leg is provided with a separate table flange, made of synthetic material. If needed, the leg can be cut to the required length.



**All seat and table legs** (except TCR 60), shown on these pages can be supplied with a chromium plated base and a high polished anodised clamp ring as an option.



Car designers have long been aware that the instrument panel must be both functional and attractive to the eye. Why should that be any different when it comes to boating?



## *Functional can be beautiful too...*

Bearing this in mind, VETUS has introduced a range of instruments, which are available with black or classic cream colour dials and supplied with both black and chromium plated bezels as standard. Now the owner or builder can choose his favourite combination when designing the instrument panel.

Whatever your choice of instruments, using a pre-wired VETUS switch panel will further enhance your dash, while providing practical control of all electrical circuits.

And if your mooring has no shore supply and there is no generator on board, you will quickly appreciate the value of VETUS maintenance-free batteries. Powerful and reliable, they are especially designed for marine use. No matter how late the TV show, tomorrow morning it will be business as usual: start the engine and off you go!

*Electricity on board*



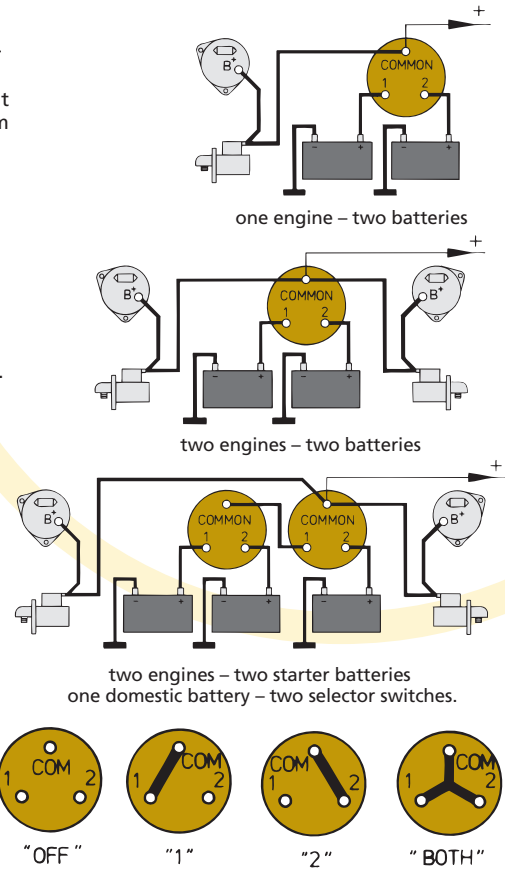


This famous VETUS battery selector switch is a multi-functional component. In the technical sense it is a sturdy rotary series switch. From the OFF position, the following batteries may be "switched on", in accordance with the switch pattern: Battery 1 only, Battery 1 plus Battery 2, Battery 2 only. The switch enables usage and charging of the batteries, both individually and in parallel connection. Dimensions: 135x135x75 mm. Capacity at 6-12-24 or 32 Volt: continuous: 175 A – interval: 300 A.

### ACCUSCH

#### KEMA AND UNDERWRITERS LABORATORIES APPROVED

The switch is provided with a red locking button, indicating and locking the switch position. This also discourages over-enthusiastic operation. If a VETUS battery selector switch is fitted, there is still the freedom of choice which battery (or batteries) will supply which service(s). Normally speaking, one of 2 batteries is used for starting the engine. But if that battery is nearly discharged (or defective), the other battery can be called to the rescue. The VETUS selector switch will prove to be invaluable on such occasions. It is even possible to draw power for the starter motor from both batteries, if the switch is set in position: "Both". The switch will "make before break" and so battery selection is possible even with the engine running (do not go through the "off" position). Using a VETUS battery selector switch, the starter battery and the domestic battery may be used and charged, as desired.



## BATTERY MAIN SWITCH



May be connected to either the positive or the negative electric cable. Two positions: "on" and "off". In the "off" position the key may be removed. Provided with two M10 connectors.

Model 600 Watertight according to IP 67. The key cannot be removed.

Four models are available:				
Model	75	100	250	600
Nominal operational voltage max.	24 Volt	24 Volt	24 Volt	24 Volt
Capacity				
- Continuous operation	75 A	100 A	250 A	450 A
- 3 minutes' load				800 A
- 5 seconds' load	350A	500 A	2500 A	3500 A

## BATTERY BOXES

VETUS battery boxes for VETUS batteries of 55 Ah, 70 Ah, 108 Ah and 108AhM.



### BATBOX



## BATTERY CABLES

- Neoprene rubber insulation jacket with a temperature range of -20° C to +85° C
- Insulation jacket available in black for negative and red for positive direct current (CE)
- Extremely flexible. The minimum bending radius is no more than 6 times the diameter
- Available with a cross sectional area of 35, 50, 70, 95, 120 or 150 mm<sup>2</sup> (150 mm<sup>2</sup> only available in black)
- Cable length per roll: 10 metres

### BATC

## BATTERY TERMINAL SETS

For cables with a cross section between 16 and 35 mm<sup>2</sup> and for cables with a cross section between 50 and 95 mm<sup>2</sup>



### BATT

### BATCC

## CABLE TAGS FOR BATTERY CABLES

Per set of two pieces  
For cable cross-sections, see price-list



## FUSE HOLDERS

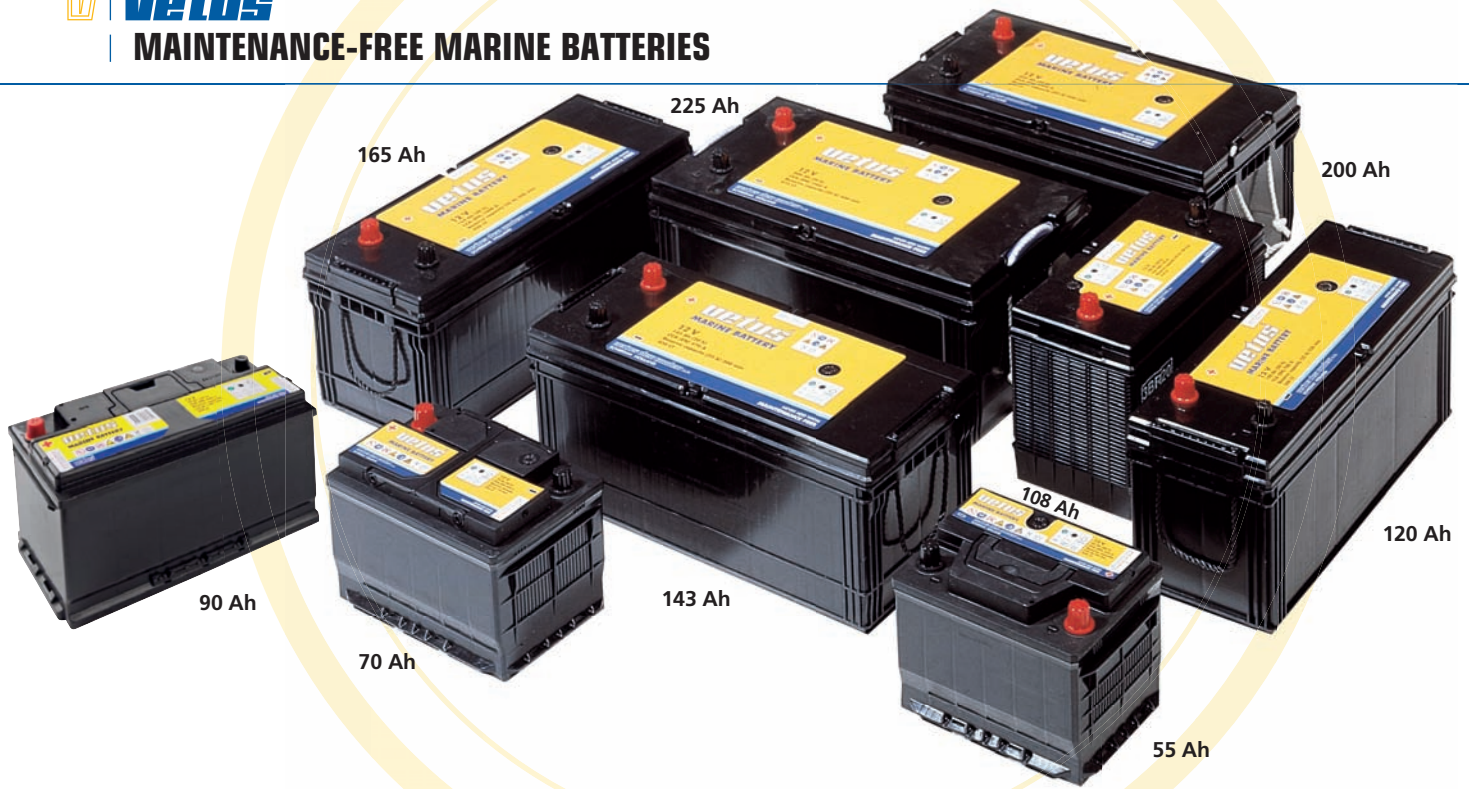
Suitable for VETUS fuses of 40-50-63-80-100-125-160-200-250-300-355-425 and 500 Amp. The fuses to match are of the so-called "slow blow" type. They are encapsulated in glass, so as to prevent fire. We suggest that you use this holder for the storage of spare fuses as well.

The fuse holder comes with a protective cover.

## STRIP FUSES

40-50-63-80-100-125-160-200-250-300-355-425 or 500 Amp.





VETUS batteries are specially designed for use aboard pleasure craft, a situation which makes quite different demands compared with other applications. For instance, a pleasure boat is usually out of operation for many months over the winter, without the possibility to recharge the batteries. Minimal **self-discharge** is therefore of prime importance during these winter months. Unlike car batteries for example, marine batteries are often heavily discharged (by lighting, pumps, ventilation, etc.) without the engine running. Therefore, the battery must be able to sustain a prolonged current drain, but still be able to start the engine again.

### NO MORE TOPPING-UP

A VETUS battery comes with a sufficient electrolyte to last the whole of its life. The casing is therefore entirely sealed with the exception of a small ventilation opening (pressure relief valve).

### MINIMAL MAINTENANCE IS REQUIRED

A VETUS battery can be simply installed and connected. Topping-up with distilled water is not necessary. Thereafter the only maintenance required is limited to recharging, which can be done with a voltage sensed battery charger or an alternator.

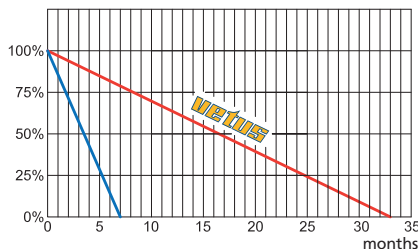
### UNIVERSAL APPLICATION

Often electrical systems on board are separate (starting and services) and two different types of batteries are required. The disadvantage is that the starter battery is only used a few times and consequently has a relatively short life, whereas the domestic battery suffers from too frequent discharging, which also shortens its life. The use of batteries which can withstand many charge/discharge cycles and which can also supply a high cold-cranking amperage is a much better choice. VETUS batteries are such batteries!

**In order to extend the life of VETUS batteries, which is already very considerable, we recommend that you use the batteries alternatively; in conjunction with a VETUS battery selector switch.**

### VERY LOW SELF-DISCHARGE

The self-discharge rate of A VETUS battery is never more than 3% per month, at an ambient temperature of 25° C. In comparison, a conventional flooded lead acid battery self-discharges at about 15% per month. Therefore, charging over the winter months is not necessary and the engine will still start next season. In addition a VETUS battery, even if only charged 50%, is able to withstand temperatures of -30° C, so removal from the boat during the winter is not necessary.



### BATTERY POLES

All VETUS batteries are supplied with SAE tapered positive and negative terminal poles, except for models BAT12070M and BAT12108M, which are supplied with dual terminals. In addition to the standard tapered pole, these models also have a 5/16" UNC stud with a butterfly nut.



### READY FOR USE

VETUS batteries come filled and ready charged so.... unpack, install and forget!

## LEAD-CALCIUM TYPE BATTERIES

### LEAD-CALCIUM

This expression refers to the composition of the plate materials. By adding calcium to the lead instead of antimony, the water consumption is negligible in comparison with the volume of electrolyte. Therefore, topping-up with distilled water will never be necessary.

### STATE OF CHARGE

The state of the charge can be easily verified. A simple hydrometer located under a small lens ("magic eye") on top of the case will tell you clearly if the battery is fully charged or not.

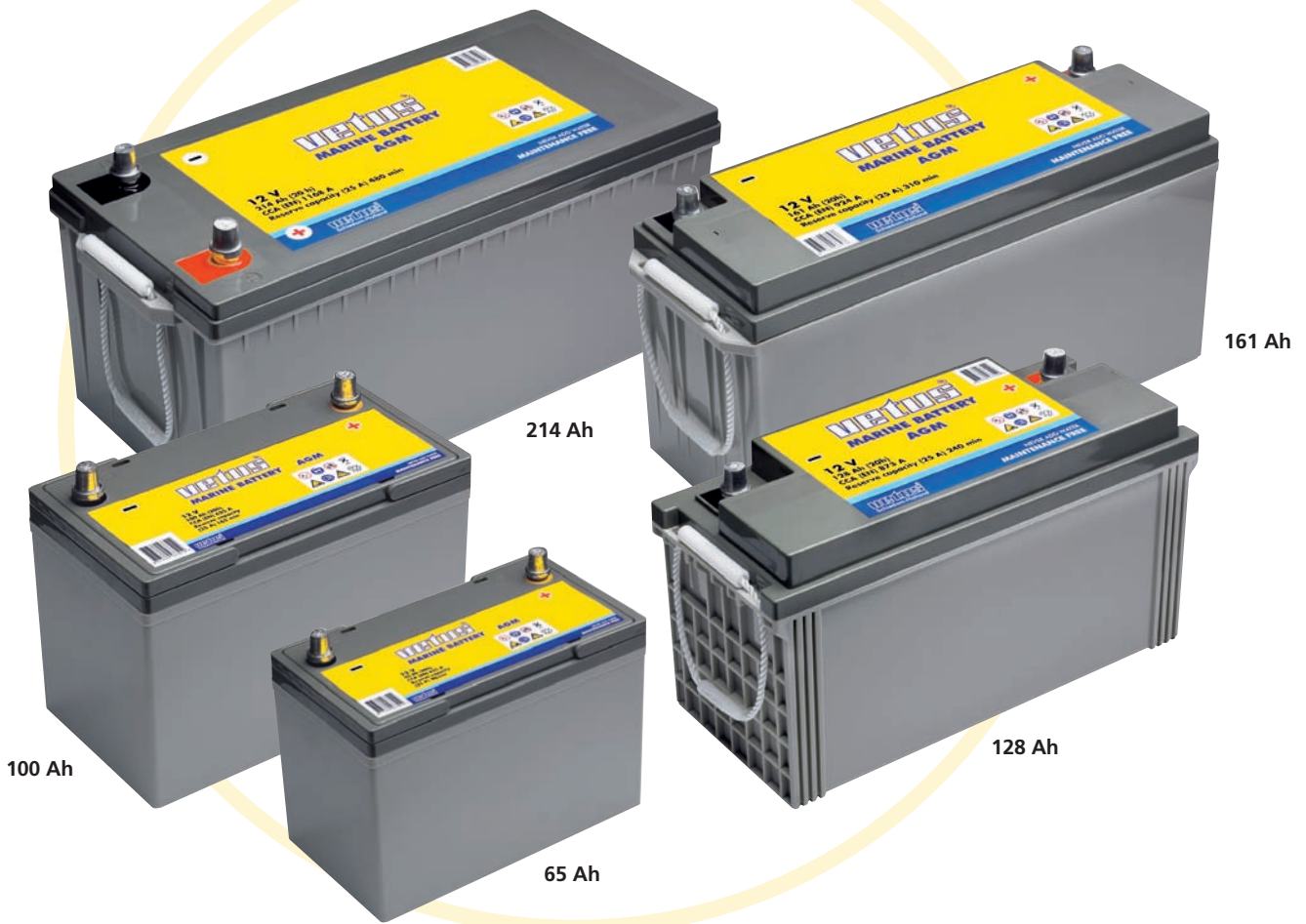
### LONG LIFETIME

A special construction of wrought grids, as well as the way in which these grids are positioned and separated, gives a VETUS lead-calcium battery an extremely long lifetime.

This VETUS battery type can withstand 14,000 charge/discharge cycles in accordance with the SAE test J.240 (1 cycle is a discharge of 25 A for 2 minutes and a charge of 25 A for 10 minutes. After each 100 cycles the battery is discharged with its cold cranking amps for 30 seconds).

### VETUS LEAD -CALCIUM TYPE BATTERIES:

- are ready for use
- have a very long life span
- have a very low self-discharge rate
- require no maintenance other than charging
- are suitable for a wide range of applications
- are provided with a carrier handle or lifting straps



## AGM

Like other VETUS maintenance-free batteries, Absorbed Glass Mat (AGM) batteries are fully sealed, apart from a very small ventilation opening (pressure relief valve). The plate material consists of lead - calcium and the electrolyte is completely absorbed by glassfibre mat separators, which means that the battery cannot leak, even in transport or if the casing is damaged.

### STORAGE

VETUS AGM batteries can be orientated in any position (even upside down), but they may not charge fully if the poles are pointing downwards. Charging of these batteries is effected by any voltage regulated battery charger on the correct setting, or by the engine alternator. Naturally, Vetus battery chargers are ideal for the purpose.

### VERY LONG LIFE SPAN

VETUS AGM batteries are genuine multi purpose marine batteries. They are suitable for cyclic deep discharge operation when used in the main bank to

power lighting, pumps, domestic appliances etc. But the high cold cranking amp rating also makes them excellent for engine starting or powering bow thrusters, anchor windlasses and other high current consumers.

#### VETUS BATTERIES, TYPE AGM:

- are supplied ready for use
- have a very long life span
- have a very low self-discharge rate
- require no maintenance other than charging
- cannot leak even when inverted or damaged
- are safe in transit, even by air
- are suitable for a wide range of applications
- are highly resistant to vibration
- are provided with a carrier handle

## VETUS LEAD –CALCIUM TYPE BATTERIES

Capacity (Ah)	55	70	70M	90	108	108M	120	143	165	200	225
Voltage	12	12	12	12	12	12	12	12	12	12	12
Cold cranking amps CCA (EN)	525	650	480	660	735	570	780	970	1000	1060	1060
Reserve capacity (in minutes) at 25 A	90	110	115	170	180	180	230	300	320	430	440
(cm) LxBxH	24,4 x 17,5 x 17,5	27,9 x 17,5 x 17,5	27,5 x 17,5 x 22,9	35,4 x 17,5 x 19	33 x 17,5 x 24	33 x 17,2 x 23,4	50,5 x 23,4	50,8 x 23,4	50,8 x 23,4	51,2 x 24,4	51,2 x 27,7 x 24,1
Weight (kg)	14,6	16,4	19,3	23,7	26	26,8	35,4	41	41,3	58,6	59,9

## VETUS BATTERIES TYPE AGM

Capacity (Ah)	65	100	128	161	214
Voltage	12	12	12	12	12
Cold cranking amps CCA (EN)	500	635	873	924	1168
Reserve capacity (in minutes) at 25 A	90	165	240	310	480
(cm) LxBxH	27,8 x 17,5 x 19	30,5 x 17,3 x 21,2	41,0 x 17,7 x 22,5	48,5 x 17 x 24,2	52,2 x 24 x 21,8
Weight (kg)	21,5	29	35	43	61

## BATTERY WATCH FOR 2 OR 3 BATTERIES

This VETUS battery watch controls 3 separate battery banks (e.g. starter battery, lighting battery and battery for the bow thruster) and ensures that all three batteries are being charged **simultaneously** by the engine's alternator or by a battery charger.

In actual fact the VETUS battery watch is:

- a three-way battery splitter, with no voltage drop
- a safeguard/alarm when low voltage occurs
- a switch on/off relay for the lighting battery
- a trickle charger of the batteries for starting and the bow-thruster (limited to 3A charging current), when using a combined charger/inverter.

The Battery Watch also features a relay that automatically disconnects the domestic (lighting) battery before it is completely discharged. This will considerably enhance the life span of the battery.



BW312A

### Technical data:

Suited for 12 or 24 Volt electrical installations.

**Features a three-way battery splitter**, suitable for an alternator with a maximum charging current of 125 A with no compensation of the alternator required.

**Isolating relay 70 A for the lighting battery.**

May be switched on or off from the control panel. Automatic switch-off when the lighting battery reaches a too low voltage. Switch-off voltage: 10.5 Volt (22 V) with a one minute delay (impervious to brief peak loads). Switch-on voltage: 11.5 Volt (23.5 V) Dimensions of the distribution block (w x d x h): 220 x 87 x 133 mm. Weight: 1,7 kg.



The remote control panel that is supplied as standard indicates the voltage of one of the three battery banks (domestic, bow thruster or start) by means of an LCD screen. The desired battery bank may be chosen by means of the function "Battery Select". An audible alarm will be triggered if the battery voltage drops too low.

The control panel may also be used to operate the relay as a main switch for the domestic battery bank. The panel is connected to the Battery Watch by means of a thin UTP cable.

### Technical data:

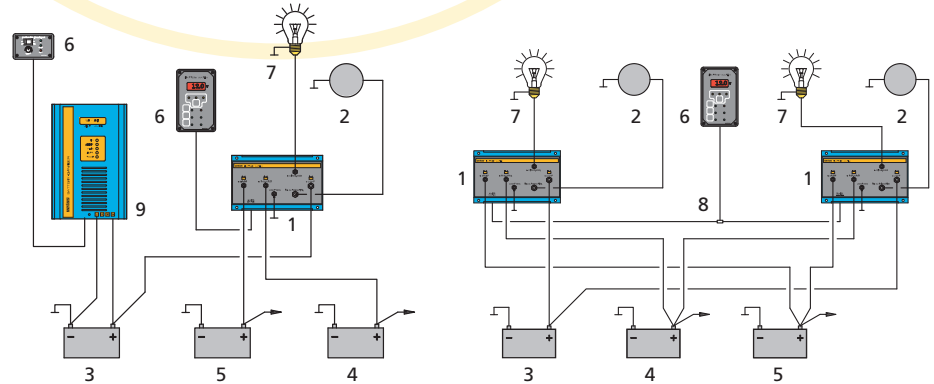
A 3-digit LCD screen with an accuracy of 0.1 Volt. Indicator LED's for panel on/off, alarm, relay, alternator charging and selected battery.

Switch functions for: panel on/off, alarm on/off, relay on/off and battery selector.

Dimensions of panel: 161 x 99 mm

Cut-out dimensions: 128 x 76 mm

In the case of a twin engine installation (two alternators), it will be possible to control and monitor two battery watches with one panel. To this effect, an extension set may be supplied, consisting of one additional battery watch and a cable to interconnect both battery watches. On the panel, a current charging monitoring light for one alternator only is available, but all other functions can be used in full.



- |                                |                         |                    |
|--------------------------------|-------------------------|--------------------|
| 1. Battery Watch               | 4. Bow thruster battery | 7. Consumers       |
| 2. Alternator                  | 5. Starter battery      | 8. Adapter         |
| 3. Domestic (lighting) battery | 6. Remote control panel | 9. Battery charger |

## BATTERY SPLITTER

### FOR SIMULTANEOUS CHARGING OF 2 OR 3 BATTERY BANKS FROM ANY CHARGING SOURCE, WITH NEGLIGIBLE VOLTAGE DROP

A battery splitter may be considered as an automatic battery selector switch. It ensures automatic distribution of the charging current from the alternator and/or the battery charger, to all banks of batteries, whilst keeping them insulated as supply sources. This is possible by virtue of the fact that the semiconductors employed, allow current to flow from the charging source to each of the battery banks separately and not the other way around. In other words: it is not possible for one battery bank to discharge into another. The battery for domestic services may be (almost) exhausted but the starter battery will remain unaffected.

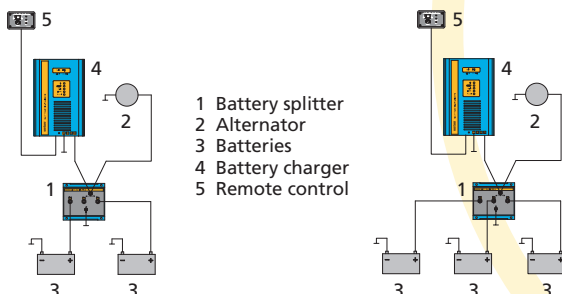
Once the engine has been started, the alternator will automatically recharge all banks of batteries.

**IN CONTRAST WITH MOST OTHER MAKES OF DIODE SPLITTER, THIS VETUS ALTERNATIVE HAS NEGLIGIBLE VOLTAGE DROP, DUE TO THE USE OF MOSFET TRANSISTORS INSTEAD OF DIODES (0.1 V AT 20 A, INSTEAD OF 0.7 V).**

Therefore, the actual charging voltage is almost identical to the voltage provided by the alternator, ensuring optimum battery charging. There is no need to compensate the output of the alternator, even if that is possible.



BS125



- |                     |
|---------------------|
| 1. Battery splitter |
| 2. Alternator       |
| 3. Batteries        |
| 4. Battery charger  |
| 5. Remote control   |

**VETUS BATTERY SPLITTERS ARE SUITABLE FOR 12 AND FOR 24 VOLT INSTALLATIONS AND FOR 2 OR 3 BATTERY BANKS. THE MAXIMUM CHARGING CURRENT IS 125 A.**

### Technical data:

Code	Dimensions	Weight
BS1252	125 A for 2 batteries	150 x 133 x 83 mm
BS1253	125 A for 3 batteries	150 x 133 x 83 mm

## VETUS BATTERY CHARGERS MEET ALL REQUIREMENTS OF DAILY USE ON BOARD

- They are suitable for connection to 120 or 230 Volts AC mains supply.
- Even at very low voltage, these chargers are fully operational: 80 Volts (instead of the usual 120 V) or 180 Volts (instead of the normal 230 V).
- All VETUS battery chargers – with the exception of the smallest model BC12202A – feature three outputs, allowing simultaneous charging of up to three banks of batteries (model BC12202A has 2 outputs).
- VETUS battery chargers are three-phase chargers: normal, boost and float.
- The charging characteristic can be adjusted for wet, gel filled, semi-traction or AGM (absorbed glass mat) batteries.
- Protection is built in for: Output terminal short-circuit, high or low input voltage, excessively high battery voltage and charger temperature.
- Polarity reversal is indicated by a warning LED and alarm buzzer.
- These VETUS battery chargers are high quality, thus ensuring the longest possible battery life span.
- They may stay switched on permanently, even over the winter.
- All VETUS battery chargers have the optimum "IUoU" charging characteristic, with a "float phase". With this characteristic, the charger reduces the output boost current when the so called "gas voltage" is reached. In the final charging phase, it reduces the charging current even further until the float voltage is reached, thus preventing the battery from gassing and consuming water.

**Attention: For charging separate battery banks using the engine alternator, a VETUS Combi-Charger-Splitter or Battery Splitter (see page 64) is the ideal appliance. Vetus battery splitters do not cause any voltage drop and compensating the output of the alternator is therefore unnecessary.**

### BCPANEL

This remote control panel may be connected to all battery chargers shown on this page.

The panel has the following functions and indications:

- On/Off switch for battery charger.
- Output current adjustment, allowing the battery charger to work from low output shore supplies.
- Battery charge status
- Fault warning LED and buzzer. The nature of the fault is then indicated on the battery charger panel itself.

The remote control panel is connected to the battery charger by means of a thin UTP cable. Dimensions of the panel: 99 x 62,5 mm. Cut-out dimensions: 70 x 52 mm.



Input connection : 80-130 Volt or 180-250 Volt / 50 or 60 Hz  
 Max battery capacity for charging time 11 - 14 hours :  
 - Conventional batteries: 135 - 200 Ah  
 - Gel batteries: 100 - 130 Ah  
 Dimensions : 293 x 180 x 95 mm  
 Weight : 1,5 kg

### BC12202A

(20 Ampère – 12 Volt)

Input connection : 80-130 Volt or 180-250 Volt / 50 or 60 Hz  
 Max battery capacity for charging time 11 - 14 hours :  
 - Conventional batteries: 175 - 250 Ah  
 - Gel batteries: 130 - 170 Ah  
 Dimensions : 293 x 180 x 95 mm  
 Weight : 1,7 kg

### BC12263A

(26 Ampère – 12 Volt)



### BC12403A

(40 Ampère – 12 Volt)

Input connection : 80-130 Volt or 180-250 Volt / 50 of 60 Hz  
 Max battery capacity for charging time 11 - 14 hours :  
 - Conventional batteries: 270 - 440 Ah / BC24303A: 200 - 300 Ah  
 - Gel batteries: BC12403A: 200 - 250 Ah / BC24303A: 150 - 200 Ah  
 Dimensions : 246 x 305 x 90 mm  
 Weight : 3,5 kg

### BC24303A

(30 Ampère – 24 Volt)

### BC12603A

(60 Ampère – 12 Volt)

### BC12803A

(80 Ampère – 12 Volt)

### BC24503A

(50 Ampère – 24 Volt)

Input connection : 80-130 Volt or 180-250 Volt / 50 or 60 Hz  
 Max battery capacity for charging time 11 - 14 hours :  
 - Conventional batteries: BC12603A: 400 - 600 Ah / BC12803A: 550 - 800 Ah / BC24503A: 350 - 500 Ah  
 - Gel batteries: BC12603: 300 - 400 Ah / BC12803A: 400 - 525 Ah / BC24503A: 250 - 325 Ah  
 Dimensions : 340 x 300 x 90 mm  
 Weight : 4,5 kg



### BC24803A

(80 Ampère – 24 Volt)

Input connection : 80 - 130 Volt / 150 or 60 Hz / 180 - 250 Volt / 50 or 60 Hz  
 Max battery capacity for charging time 11 - 14 hours :  
 - Conventional batteries 550 - 800 Ah  
 - Gel batteries 400 - 525 Ah  
 Dimensions : 340 x 289 x 181 mm  
 Weight : 8 kg

### TEMPS2

### BATTERY TEMPERATURE SENSOR

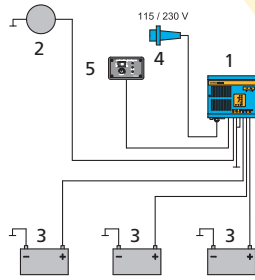
As the battery temperature increases, the charging voltage should be reduced, in order to prevent water loss from the battery. An optional temperature sensor may be connected to any VETUS battery charger and will ensure that the charge voltage is always adapted to the battery temperature.



# COMBINED BATTERY CHARGER / BATTERY SPLITTER



**BCS1245**



1. Combined Battery Charger/Battery Splitter
2. Alternator
3. Batteries
4. Shore supply
5. Remote control panel

This combined VETUS Batter Charger / Battery Splitter is designed for optimum simultaneous charging of up to three banks of batteries. The batteries can be charged in the fastest and most efficient way by both the battery charger and/or the engine alternator. Fitting a separate battery splitter (diode splitter) is no longer necessary, with the clear advantages of: lower cost, faster installation time, fewer cables and more space.

In contrast with most other makes of diode splitter, this VETUS alternative has negligible voltage drop, due to the use of mosfet transistors instead of diodes (0.1 V at 25 A, instead of 0.7 V) and compensating the output of the alternator is therefore unnecessary.

Technical data			
Code	Description	Dimensions	Weight
BCS1225	12V, 25A battery charger/125A battery splitter	300x245x115	2.5 kg
BCS1245	12V, 45A battery charger/125A battery splitter	330x256x115	4.3 kg
BCS2425	24V, 25A battery charger/125A battery splitter	330x256x115	4.3 kg
BCS2445	24V, 45A battery charger/125A battery splitter	370x310x115	5.3 kg

Supply voltage: 80-130 Volt/60 Hz or 180-250 Volt/50 Hz

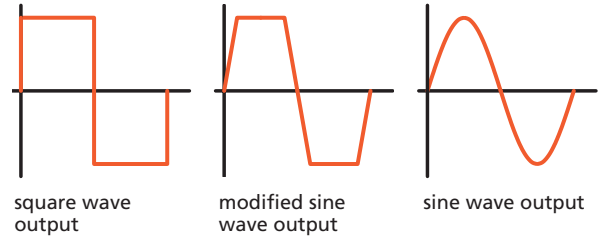
## SINE WAVE INVERTERS

**IV200012**



Inverters that transform 12 or 24 Volt DC to 230 Volt AC can be divided into three groups, according to the shape of the AC output voltage produced. Inverters with a square wave output, which may be used to power less sensitive electronic equipment. Somewhat better is a modified sine wave output, which may be used to power TV, microwave oven, electronically controlled washing machine etc; only an inverter that produces a pure sine wave output should be considered. VETUS inverters produce a pure sine waveform and are therefore ideal for powering electronics or any other low power electrical equipment.

Owing to the high-frequency technology used, these inverters no longer have bulky transformers and are therefore light in weight. With their high peak power, a VETUS inverter may also power equipment such as electric motors and refrigerators. The inverters have inbuilt protection for: high or low battery voltage, overload, short-circuit, overheating and reversed polarity.



Vetus sine wave inverters	IV050012	IV100012	IV150012	IV200012
	IV050024	IV100024	IV150024	IV200024
Continuous output up to 75° C, cos phi=1	600W	1000W	1500W	2000W
Continuous output, max. 30 minutes	780W	1300W	1950W	2600W
Peak output, max. 5 seconds	900W	1500W	2250W	3000W
Nominal battery voltage	12V DC 24V DC			
Input voltage range	10.5 - 16V ± 0.5V 21 - 31V ± 0.5V			
Output voltage	200V/220V/230V/240V ±2%, selection by dip switch			
Frequency	50 / 60Hz ±0.05%, selection by dip switch			
Harmonic distortion	< 3%			
UPS input voltage range	102 - 245V AC			
UPS switch-over time	< 10 msec.			
Energy consumption at no load	<1.5 W (in energy saving position)			
Cos phi	all types of loads are permitted			
Technology	high-frequency			
Weight (kg)	4.5	5.5	7	10
Dimensions (mm)	350x285x120	410x285x120	450x285x120	410x285x185
<b>Accessories (option)</b>				
Remote control	yes	yes	yes	yes

## REMOTE CONTROL PANEL



**IV150012**

All VETUS inverters may be connected to a remote control panel that has the following functions and indications

- On/Off switch for inverter.
- Fault warning LED and buzzer. The nature of the fault is then indicated on the inverter panel itself.

The remote control panel is connected to the battery charger by means of a thin VTP cable. Dimensions of the panel: 85 x 85 mm. Build in dimensions: 40 mm.

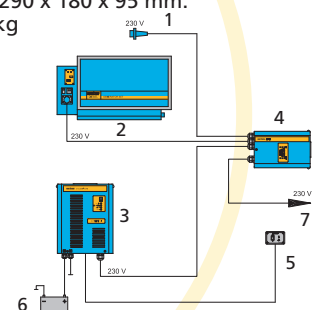
## AUTOMATIC CHANGE-OVER DEVICE

This automatic change-over device will switch in the inverter automatically if the shore supply or the generator is disconnected. Naturally, only loads up to the rated limit of the inverter and battery capacity can be supplied. Specifications: Capacity: 4.5 kVA Dimensions: 290 x 180 x 95 mm. Weight: 2.4 kg



**IVPS**

1. Shore supply
2. Generator
3. Inverter
4. Automatic change-over device
5. Remote control panel
6. Battery
7. Consumers



## GAS DETECTOR WITH CARBON MONOXIDE DETECTION



GD1000

The VETUS gas detector model GD1000 offers a gas detection system for a range of combustible gases including propane, butane, methane and hydrogen. In addition it will also detect poisonous carbon monoxide. A single sensor is supplied as standard, which can detect both flammable gases (such as bottled gas) and carbon monoxide. A second sensor can be fitted as an option, for gas detection in an alternative location.

The push button marked "Valve" will manually actuate a remote solenoid operated gas valve, if this is installed in the system. If this solenoid valve is in the open position (or not fitted), the presence of gas is detected continuously. If the valve is closed, detection will take place intermittently. Please note, the valve itself is not supplied with the gas detector.

If the gas detector senses high concentrations of flammable gases and/or carbon monoxide, it will trigger an acoustic alarm and a LED on the control panel. Petrol fumes can trigger the alarm at extremely low concentrations, which makes this device less suitable for boats with petrol engine(s). The "Mute" button will silence the alarm.

The gas detector is provided with three switched connections rated at 1 Amp each. In the event of an alarm situation, these will actuate (if fitted), an extraction ventilator, an external alarm or horn and a solenoid operated gas valve. The extraction ventilator can also be operated manually by means of the "Fan" button. Should the supply voltage drop too low, an acoustic alarm will be triggered and the LED on the control panel will flash.

A test function confirms the correct functioning of the gas sensor(s), as well as the three switched connections for ventilator, external alarm and gas valve. A LED on the sensor indicates when it has reached its maximum life span and should be replaced.

### Technical data:

Voltage:	12 or 24 Volt D.C.
Current consumption:	Stand-by: 2 mA
	Continuous operation: 20 mA at 12 Volt, 10 mA at 24 Volt
	Intermittent operation: 10 mA at 12 Volt, 5 mA at 24 Volt
Maximum relay contact ratings for extractor fan, gas solenoid valve and external alarm:	1 A for each function

### Dimensions:

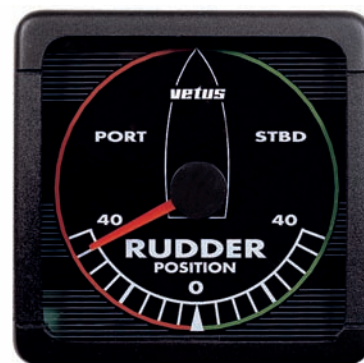
Control panel:	85 x 85 mm
Build in depth:	40 mm
Sensor	35 x 26 x 62 mm high

## RUDDER POSITION INDICATORS

This electrical rudder position indicator displays the angle of the rudder at the steering position(s). The complete system consists of a rudder feedback unit, type RFU1718 and one or two rudder position indicators.

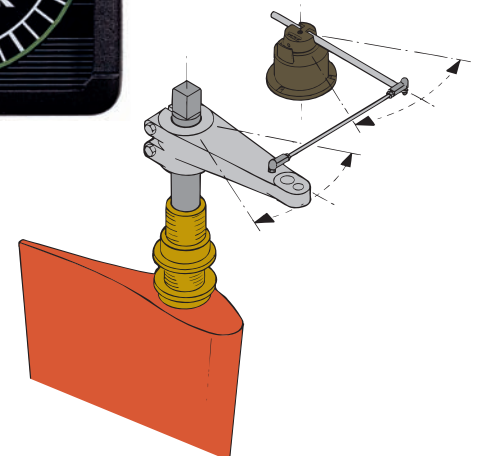
The indicator unit, type RPI1700 measures 94 x 94 x 15 mm and the build-in depth is 30 mm. It is suitable for both 12 and 24 Volt installations, has scale illumination and is supplied with 15 metres of connection cable. The indicator is waterproof and comes with a mounting gasket.

The rudder feedback unit, type RFU1718 is also suitable for 12 or 24 Volt supply. It comes as standard with an adjustable linkage arm equipped with ball joints for connection to the tiller arm and can be mounted on either side of the tiller arm and either way up. Please note that it is not watertight and should therefore be fitted in a dry location. This rudder feedback unit will also operate Vetus rudder position indicators type RPI1800. Any combination of indicators can be operated by the same feedback unit.



RPI1700

RFU1718



## TYPE P8F

This panel is splash proof according to IP 64. It has 8 separate circuits, each provided with a switch, indicator LED and fuse holder and it is suitable for both 12 Volt and 24 Volt D.C. electrical installations.



The panel can be used with conventional automotive (ATO) fuses or with automatic fuses.

The following automotive (ATO) fuses are supplied as standard: 2 x 1A, 2 x 3A, 4 x 5A, 2 x 7.5A, 4 x 10A and 2 x 15A. Automatic fuses may be ordered as optional equipment.

The 8 fuse holders are located in a separate compartment, which can be opened at the front of the panel and either type of fuse may be fitted. Sixty (60) self-adhesive name/symbol plates for different functions are standard supply. There are also 2 covers supplied for the fuse compartment, depending on whether automatic fuses or conventional automotive (ATO) fuses are used.

The panel is completely pre-wired and provided with a terminal rail, for connection of the power supply and the consumer equipment. The panel is made of synthetic and non-corrosive materials.

Dimensions: 99 x 161 mm. Built-in depth: 45 mm.



For automatic fuses.

P8F



For conventional automotive (ATO) fuses.

## TYPE P6

This panel features 6 on/off switches, 6 monitoring L.E.D.'s and a choice of either 6 automatic fuses, or 6 tubular glass fuses of 10 A.  
 Dimensions: 94 x 156 mm  
 Built-in depth: 50 mm  
 Available for 12 or 24 Volt D.C. electric installations. 60 Different name-plates (self-adhesive) are supplied for 6 positions.



**P6CB** automatic fuses



**P6F** tubular glass fuses

## TYPE P12

This panel features 12 on/off switches, 12 monitoring L.E.D.'s and a choice of either 12 automatic fuses or 12 tubular glass fuses of 10 A.  
 Dimensions: 188 x 156 mm  
 Built-in depth: 50 mm

Available for 12 or 24 Volt D.C. electric installations. 60 different name-plates (self-adhesive) are supplied for 12 positions.



**P12F** tubular glass fuses



**P12CB** automatic fuses

VETUS switch panels are supplied pre-wired. The only work required is to connect the positive and negative feeds and the various services (lights, pumps etc.). These panels are made of synthetic and non-corrosive materials.

# ENGINE INSTRUMENT PANELS (BLACK DIAL)



**MP34BS12A**

**MP34BS24A**

VETUS **waterproof** engine instrument panel, with 6 monitoring lights, buzzer, pre-heating/starter switch with removable key, combined revolution/hour counter, temperature gauge, voltmeter and oil pressure gauge.

Dimensions: 255 mm x 161 mm.  
Built-in depth 121 mm.



**MP21BS12A**

VETUS **waterproof** engine instrument panel, provided with 6 monitoring lights, combined revolution/hour counter, buzzer and pre-heating/starter switch with removable key. An additional instrument can be fitted. This panel is excellently suited for installation on a fly-bridge or a second steering position. Panel dimensions: 193 mm x 161 mm. Built-in depth: 121 mm.



**XTPAN252A**

**EXTENSION PANEL**  
Designed to receive 2 VETUS instruments with a cut-out diameter of Ø 52 mm.  
Dimensions: 161 x 99 mm.  
(Instruments to be ordered separately.)



**PWL**

In order to reduce condensation as far as possible, all VETUS instrument gauges are double glazed.



All VETUS engine instrument panels featuring a key starter switch are supplied with a separate watertight cover for the switch.

**ENGINE INSTRUMENT PANELS (CREAM DIAL)**



**MP34BN12A**

**MP34BN24A**

VETUS **waterproof** engine instrument panel, with 6 monitoring lights, buzzer, pre-heating/starter switch with removable key, combined revolution/hour counter, temperature gauge, voltmeter and oil pressure gauge.  
Panel dimensions: 255 mm x 161 mm.  
Built-in depth: 121 mm.



**MP21BN12A**

VETUS **waterproof** engine instrument panel, with 6 monitoring lights, combined revolution/ hour counter, buzzer and pre-heating/starter switch with removable key. An additional instrument can be fitted. This panel is excellently suited for installation on a fly-bridge or a second steering position.  
Dimensions: 193 mm x 161 mm.  
Built-in depth: 121 mm.



**DESIGN YOUR OWN PANEL WITH THE "MYSTYLE" SYSTEM**

Many designers and installers wish to lay out their own instrument panel, rather than using a standard panel supplied by the engine manufacturer. This can now be easily achieved using the MYSTYLE system.

**Consider the advantages:**

- Choose your own instruments, black or cream and for 12 or 24 V supply.
- Instruments can be positioned up to 50 cm away from the key switch.
- All cables are bundled and colour coded: no more tracing loose wires.
- Cable plugs and connectors are factory fitted, ready to connect to Vetus engine instruments.
- A comprehensive instruction manual and wiring diagram is included, making assembly easy.

**Standard system consists of:**

- Control panel (130 x 35 mm) with 6 monitoring lights
- Alarm buzzer
- Pre-heat and starting key switch.
- Cable for revolution counter/hour counter
- Cables for voltmeter, oil pressure gauge, water temperature gauge
- Plugs for connection of extension cables

**Optional equipment:**

- Extension cable to the engine, available in 2, 4 or 6 metre length
- Universal wiring harness
- Cable splitter to connect to a second panel

**XTPAN252A**

**EXTENSION PANEL**  
Designed to receive 2 VETUS instruments with a cut-out diameter of Ø 52 mm.  
Dimensions: 161 x 99 mm (Instruments to be ordered separately).



**MP10B12**

VETUS **waterproof** engine instrument panel **for sailing boats**, with 5 monitoring lights, buzzer and a pre-heating/starter switch with removable key.  
Panel dimensions: 156 mm x 94 mm.  
Built-in depth: 120 mm.



**All VETUS engine instrument panels on page 68 and 69 come with a multi-pin connector as standard.**

## This is why VETUS boat instruments are so outstanding

The market offers a large variety of boat instruments, in all sorts and sizes. Here are three arguments why you should choose VETUS boat instruments:

- **High degree of accuracy:** Owing to the very special suspension of the mechanism and the removable pointer, each instrument can be tested and calibrated individually. And that is exactly what is done!
- **Reliability and longevity:** The annual number of repair jobs can be counted on the fingers of one hand. Literally!
- **Smart illumination:** No solid dials with over-head illumination from the edge, but translucent dials instead, which are illuminated from below,

thus offering optimum readability.

- In order to prevent condensation as far as possible, all VETUS instruments are double glazed.
- All instruments are supplied with two round bezels as standard: one black plastic and the other chrome finish plastic. Height: 10 mm. The large instruments have an overall diameter of  $\varnothing$  114 mm and fit a cut-out of  $\varnothing$  100 mm. The small instruments have an overall diameter of  $\varnothing$  63 mm and fit a cut-out of  $\varnothing$  52 mm.

### REVOLUTION COUNTER (WITH HOUR COUNTER INCORPORATED)

12/24 Volt D.C., suitable for alternators with W-connection. Suited for diesel engines. Scale calibration: 0-4000 r.p.m.



TACHB

### HOUR COUNTER

Analogue engine hour counter which connects to the ignition switch.



HOURLB

### VOLTMETER

Can be supplied for 12 or 24 Volt D.C. Scale calibration respectively: 10-16 V and 20-32 V.



VOLTB

### TEMPERATURE GAUGE

Can be supplied for 12 or 24 Volt D.C. Scale calibration: 40-120°C. and 105-250°F. Temperature sensors are available as optional equipment.



TEMPB

### EXHAUST TEMPERATURE ALARM

Designed for water injected exhaust systems. Provides a visual and an audible alarm when the temperature inside the exhaust hose or the muffler exceeds an acceptable level. The temperature sensors, to be fitted into the exhaust hose or the

waterlock/ muffler and the alarm unit must be ordered separately. In the case of a twin engine installation 2 sensors may be connected to 1 alarm unit, if so required. One sensor may also serve two alarm units, e.g. in the case of a second steering position.



XHIB

### AMMETER

Scale calibration: +/- 60 A, for 12 or 24 Volt D.C., with shunt incorporated. This ammeter is also available with scale calibration of +/- 100 A, with a separate shunt (AMPSH).



AMPB

### OIL PRESSURE GAUGE

Available for 12 or 24 Volt D.C. Scale calibration 0-8 kg/cm<sup>2</sup> and 0-110 p.s.i. Oil pressure sensors are available as optional equipment.



OILB

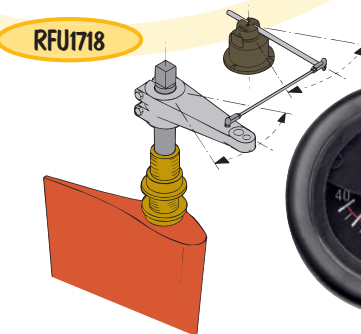
### RUDDER POSITION INDICATORS

Both indicating units have scale illumination and are suitable for both 12 V and 24 V electrical installations.



RP1810B

RFU1718



SENDING UNIT

RP1800B



**LEVEL INDICATORS (12 OR 24 VOLT) WITH BLACK DIAL |**

**WATERB**



**WATER**

Available for 12 or 24 Volt D.C.

**FUELB**



**FUEL**

Available for 12 or 24 Volt D.C.

**WASTEB**



**WASTE WATER (BLACK OR GREY)**

Available for 12 or 24 Volt D.C.

The waste water indicator WASTEB can be provided with an interface (code EP412326), suitable for 12 and 24 V installations. A warning light can be connected to this interface, which will then indicate when the holding tank is almost full and that it is better not to use the toilet.

**UNIVERSAL TANK FLOAT**

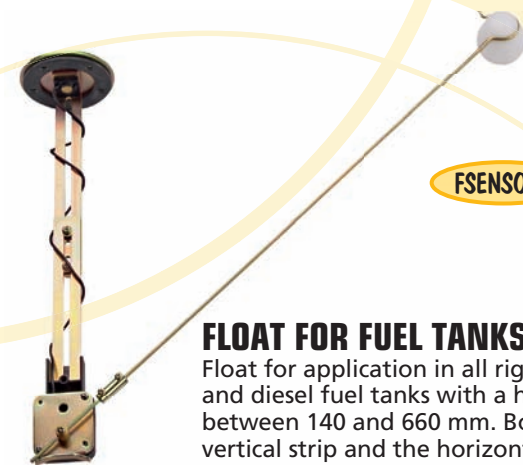
**Universal** Tank float for drinking water, petrol and diesel fuel. Available in 7 sizes: 280, 320, 380, 480, 580, 680 or 780 mm in length. Every 2,5 centimetres the VETUS universal tank float indicates the difference in fluid level. Just compare this with other systems which can only show 3 positions (full - about half full - empty).



**SENSOR**

VETUS universal tanks floats combine state-of-the-art technology and indestructibility: Each tube length contains the maximum number of reed contacts, instead of the bare minimum of just three (full, half full, empty). By virtue of this, maximum accuracy of your fluid gauges is ensured. Besides, the reed contacts (electronic switches) are sealed "fluid-tight".

**FSENSOR2**



**FLOAT FOR FUEL TANKS**

Float for application in all rigid petrol and diesel fuel tanks with a height between 140 and 660 mm. Both the vertical strip and the horizontal float arm are completely adjustable.

**WWSENSOR**



**FLOAT FOR WASTE WATER TANKS**

The arm length is adjustable between 200 and 412 mm.

In order to reduce condensation as far as possible, all circular VETUS indicators are double glazed.





**REVOLUTION COUNTER (WITH HOUR COUNTER INCORPORATED)**

12/24 Volt D.C., suitable for alternators with W-connection. Suited for diesel engines. Scale calibration: 0-4000 r.p.m.



**TACHW**

**HOURLY COUNTER**

Analogue engine hour counter which connects to the ignition switch.



**HOURLY**

**VOLTMETER**

Can be supplied for 12 or 24 Volt D.C. Scale calibration respectively: 10-16 V and 20-32 V.



**VOLTV**

**TEMPERATURE GAUGE**

Can be supplied for 12 or 24 Volt D.C. Scale calibration: 40-120° C and 105-250°F.

Temperature sensors are available as optional equipment.



**TEMPW**

**AMMETER**

Scale calibration: +/- 60 Amp., for 12 or 24 Volt D.C., with shunt incorporated.



**AMPW**

**EXHAUST TEMPERATURE ALARM**

Designed for water injected exhaust systems. Provides a visual and an audible alarm when the temperature inside the exhaust hose or the muffler exceeds an acceptable level. The temperature sensors, to be fitted into the exhaust hose or the waterlock/muffler, and the alarm unit must be ordered separately. In the case of a twin engine installation 2 sensors may be connected to 1 alarm unit, if so required. One sensor may also serve two alarm units, e.g. in the case of a second steering position. Available for 12 and 24 Volt D.C.



**XHIW**

**OIL PRESSURE GAUGE**

Available for 12 or 24 Volt D.C. Scale calibration: 0-8 kg/cm<sup>2</sup> and 0-110 p.s.i. Oil pressure sensors are available as optional equipment.



**OILW**

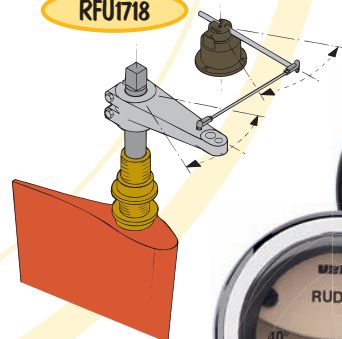
**RUDDER POSITION INDICATORS**

Both indicating units have scale illumination and are suitable for both 12 V and 24 V electrical installations.



**RFU1718**

**RP1800W**



**SENDING UNIT**



**LEVEL INDICATORS (12 OR 24 VOLT) WITH CREAM DIAL |**

**WATERW**



**WATER**

Available for 12 or 24 Volt D.C.

**FUELW**



**FUEL**

Available for 12 or 24 Volt D.C.

**WASTEW**



**WASTE WATER (BLACK OR GREY)**

Available for 12 or 24 Volt D.C

The waste water indicator WASTEW can be provided with an interface (code EP412326), suitable for 12 and 24 V installations. A warning light can be connected to this interface, which will then indicate when the holding tank is almost full and that it is better not to use the toilet.

**UNIVERSAL TANK FLOAT**

Universal Tank float for drinking water, petrol and diesel fuel. Available in 7 sizes: 280, 320, 380, 480, 580, 680 or 780 mm in length. Every 2,5 centimetres the VETUS universal tank float indicates the difference in fluid level. Just compare this with other systems which can only show 3 positions (full - about half full - empty).

**SENSOR**

VETUS universal tanks floats combine state-of-the-art technology and indestructibility: Each tube length contains the maximum number of reed contacts, instead of the bare minimum of just three (full, half full, empty). By virtue of this, maximum accuracy of your fluid gauges is ensured. Besides, the reed contacts (electronic switches) are sealed "fluid-tight".



**FSENSOR2**



**FLOAT FOR FUEL TANKS**

Float for application in all rigid petrol and diesel fuel tanks with a height between 140 and 660 mm. Both the vertical strip and the horizontal float arm are completely adjustable.

**FLOAT FOR WASTE WATER TANKS**

The arm length is adjustable between 200 and 412 mm.

**WWSENSOR**



In order to reduce condensation as far as possible, all circular VETUS indicators are double glazed.



This electronic compass features a rotating card display and a fixed lubber line reference. The vessel's heading is at top dead centre, thereby making it as easy and natural to read as any conventional magnetic compass. The exact heading is also indicated digitally at the bottom of the display and may be shown as "True" or "Magnetic". For complete reliability, the electronic compass uses a solid state electronic fluxgate with no moving parts. The system includes the display head, fluxgate compass and 10 metres of connection cable between the two components.

**Specification:**

- Display of magnetic course
- Display of true course
- Resolution: 0.5°
- NMEA 0183 interface
- Internal illumination
- Watertight to IP 65
- Supplied with cover
- Length of connection cable: 10 m
- Voltage: 12 or 24 Volt DC
- Power consumption: 40 mA at 12 Volt, 20 mA at 24 Volt
- Dimensions: 110 x 110 x 24 mm high. Build in depth: 32 mm
- The pane of the read-out instrument is covered with a scratch-free coating.



EC

**ELECTRONIC COMPASS/GPS**

The VETUS electronic compass and GPS indicates both the vessel heading and positional data on the same display. The compass course (true or magnetic) is shown on a large scale digital display, together with an analogue moving bar indicator at the top of the screen. In the lower part of the screen, the relevant GPS data is displayed in degrees of longitude and latitude. A simple push button menu also allows the time, the date, the log, the trip counter or the boat speed to be shown. The latter three functions are calculated from the GPS data. It is possible to connect more than one display to the sensor unit, for example a VETUS electronic compass type EC. All indicating units have a NMEA0183 interface, allowing easy interconnection of the instruments. The VETUS electronic compass and GPS comes complete with a solid state combined compass/GPS sensor and 10 metres of connection cable.

**Specification:**

- Large scale digital display of:
  - Magnetic course
  - True course
  - GPS course
- The pane of the read-out instrument is covered with a scratch-free coating.
- Small scale digital display of:
  - GPS information
  - Trip counter, log and boat speed (using GPS data)
- Analogue moving bar heading indicator.
- NMEA0183 interface
- Watertight to IP 65
- Supplied with cover
- Length of connection cable: 10 m
- Voltage: 12 or 24 Volt DC
- Power consumption: 40 mA at 12 Volt, 20 mA at 24 Volt
- Dimensions: 110 x 110 x 24 mm high. Build in depth: 32 mm



ECGPS

**“SOLID STATE” SENSOR FOR ELECTRONIC COMPASS/ELECTRONIC COMPASS WITH GPS**

In general, sensors for electronic compasses are highly vulnerable, on account of the cardanic suspension of the magnets, and they must be replaced regularly.

Contrary to this, the VETUS compass sensor features a unique, solid state system, without any moving parts. By virtue thereof, your sensor will keep functioning properly, even under the most extreme circumstances.

The VETUS compass sensor can be combined with all makes and types of display instruments, as long as they are provided with an NMEA0183 interface. The sensors are available with and without GPS function.

**Specification:**

- 16 channels
- Combined sensor for compass and GPS
- NMEA0183 interface
- Resolution: 0,1°
- Watertight to IP 66
- Angle of inclination compensated to 35°
- Accuracy: 50 % with 3m CEP, 90% with 7m CEP
- Suitable for both 12 Volt and 24 Volt D.C. electrical circuits
- Power consumption: 50 mA at 12 Volt and 30 mA at 24 Volt
- Length of connection cable: 10 m
- Dimensions: 110 x 73 x 57 mm high

**ABSOLUTELY NO MOVING PARTS**



The VETUS Combi-4 indicates according to selection: boat speed, distance covered, water depth and water temperature. Each function is easily displayed at the touch of a button, or can be automatically displayed one after another. It is possible to connect more than one display unit to a single transducer. Each display unit uses a NMEA0183 connection, to provide simple interconnection of the instruments. The standard Combi 4 consists of one display head and a multi-function transducer with 10 metres of connection cable.

**Specification:**

- Speed range: 1 - 52 knots or 1 – 96 km/hour. Indication of maximum and average speed.
- Water depth: shown in metres or feet, maximum 120 m or 400 ft.
- Adjustable deep and shallow alarms.
- Adjustable keel offset.
- Log: the distance covered in nautical miles, maximum 9999.
- Trip Log: for short distances in nautical miles, maximum 999.9.
- Push button calibration of speedometer and log.

- Water temperature: displayed in degrees Celsius or Fahrenheit. Minimum/maximum memory 0-30° C, 32-86° F.
- Internal illumination.
- NMEA0183 interface
- Connection cable length: 10 metres
- Watertight to IP 65
- Voltage: 12 or 24 Volt DC.
- Dimensions: 110 x 110 x 24 mm high. Build in depth: 32 mm.
- The pane of the read-out instrument is covered with a scratch-free coating.

**COMBI 4 TRANSDUCER**

The VETUS Combi 4 uses a single through hull transducer, which measures speed, depth and water temperature. Installation time and the number of holes in the hull are therefore considerably reduced. The transducer has a NMEA 0183 connection. Dimensions: Overall height: 124 mm. Hole diameter: 51 mm.



**COMBI 4**

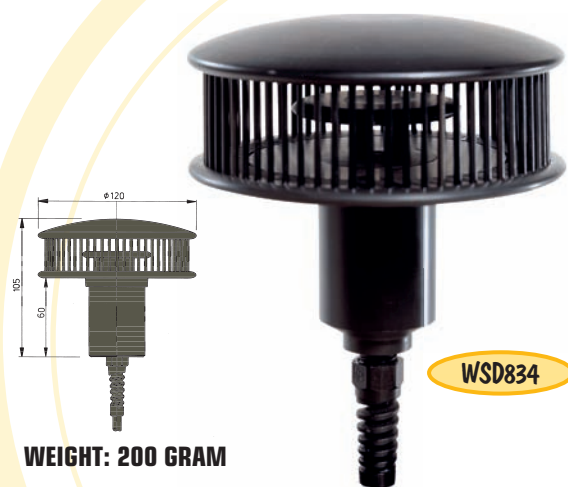
**WIND DIRECTION / WIND SPEED INDICATOR**

**A WIND SENSOR WITHOUT MOVING PARTS**

This combined sensor unit comes complete with 20 m of cable and a mounting bracket. Suitable for 12 or 24 Volt D.C.

**THIS SENSOR MAY BE CONNECTED TO ANY TYPE OF WIND INSTRUMENT WITH A NMEA 0183 INPUT**

- The instrument gives digital read-out of wind speed and both digital and analogue indication of wind direction.
- The wind speed indication can be displayed in metres/second, knots or Beaufort scale.
- Can display apparent or true (\*) wind speed and wind direction
- Adjustable damping of wind speed and wind direction.
- Maximum wind speed experienced is retained in memory.
- Analogue wind direction can be set to show magnified close hauled reading 20° to 50°.
- Adjustable acoustic wind speed alarm
- Velocity Made Good (VMG\*)
- Provided with adjustable scale illumination.
- Instrument dimensions: 110 x 110 x 57 mm (height).
- Built-in depth: 32 mm.
- The pane of the read-out instrument is covered with a scratch-free coating.



**WSD834**

**WEIGHT: 200 GRAM**

**THIS UNIQUE WIND SENSOR MEASURES BOTH THE WIND SPEED AND THE WIND DIRECTION WITH THE AID OF ONE SINGLE CHIP. OPERATION IS BASED ON THE PRINCIPLE THAT A WARM SURFACE WILL COOL DOWN WHENEVER THERE IS A CURRENT OF AIR AROUND IT. THE MORE WIND THERE IS, THE GREATER WILL BE THE COOLING-DOWN EFFECT.**



- Current consumption: 12 Volt – 140 mA (scale illumination: 20 mA) 24 Volt - 80 mA (scale illumination: 40 mA)
- Current supply is also possible via a mains voltage adaptor (110 or 230 Volt A.C.) to 12 volt D.C., with a minimum output of 250 mA. A suitable 230 Volt A.C. adapter may be supplied by VETUS
- The instrument comes complete with the solid state wind sensor, without moving parts, described on this page.

(\*) The true wind speed and wind direction, as well as the "Velocity Made Good" can only be indicated if boat speed data is input. The VETUS paddlewheel sensor SPD 002 can be used for this purpose.

This sensor may also be used to get accurate information on your PC or lap top about the wind speed and the wind direction. The VETUS software is on CD-ROM and is easy to install on your computer (see price-list).

With a drink in hand, you are reflecting with your guests on another pleasant day on the water. Or you are talking about the difficult situation in the marina, when yet again the VETUS bow thruster got you out of trouble. And then one of the guests excuses himself: "back in a sec". Some 10 minutes later he returns on deck and .... well, it is only fair to let nature take its course.



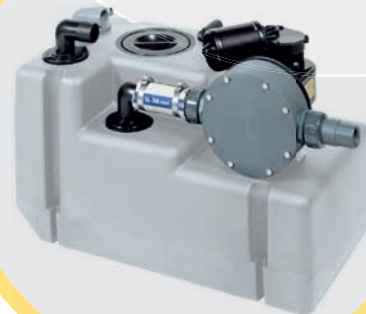
## *Just as important as a reliable engine*

For those boat owners who enjoy the benefits of a VETUS electric toilet, there is really no need to worry. The simple push button operation and powerful macerator make sure nothing can go wrong. Coupled with a VETUS waste water system, you can also relax in the knowledge that our precious environment is not being polluted further.

With a clear conscience, the contents can be safely and hygienically discharged to a land-based sewer, or emptied far out to sea. And of course, you will comply with the strictest legislation in any country or harbour you visit.

Ask your dealer about the latest regulations concerning waste water discharge and the facilities ashore. We each have a duty to protect the waters we enjoy so much.

*Sanitary equipment and the environment*



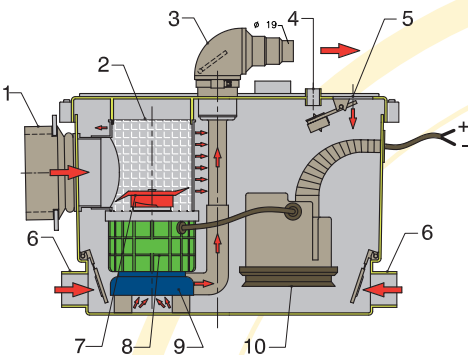


**SAPRO**

## THE VETUS SANI-PROCESSOR OFFERS THE POSSIBILITY TO USE A STANDARD DOMESTIC TOILET IN ANY STYLE OR COLOUR YOU CHOOSE, ON BOARD YOUR BOAT

Particularly on larger boats, owners often wish to install deluxe sanitary ware of their preferred style and colour; just like at home. In order to fulfil this requirement, VETUS has developed the Sani-Processor, with an electric macerator and a pump, so that an ordinary domestic toilet may be used on board. The Sani-Processor can be easily connected to a standard toilet, by means of 102 mm diameter hose (with a minimum fall of 50 mm per metre). When the toilet is flushed, the Sani-Processor will collect the contents, macerate them and pump the resultant slurry into a holding tank or directly overboard, through a hose of only 19 mm diameter. The whole process takes between 10 and 30 seconds and works almost silently. In the unlikely event of a blockage, the unit can be easily cleaned by removing the inspection lid. The connecting hoses must be odour-tight and we recommend the use of VETUS sanitary hose, type SAHOSE, described on page 88.

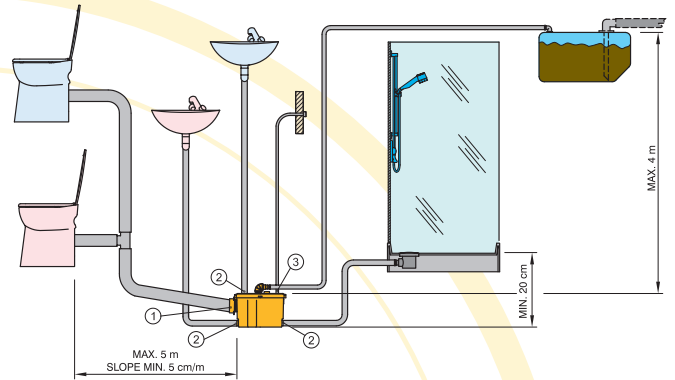
1. Toilet connection,  $\varnothing$  102 mm
2. Protective grille
3. Waste discharge connections: male  $\varnothing$  19 mm o.d. and female  $\varnothing$  25/28/32 mm i.d.
4. Breather connection,  $\varnothing$  19 mm
5. Washbasin / bidet connection,  $\varnothing$  40 mm
6. Washbasin or shower connection,  $\varnothing$  40 mm
7. Cutter knife (macerator)
8. Electric macerator motor
9. Discharge pump
10. Float switch.



### TECHNICAL SPECIFICATIONS

- Available for 12 or 24 Volt DC or 230 Volt/50 Hz or 120 Volt / 60 Hz.
- Macerator diameter: 98 mm
- Nominal power consumption: approx. 370 W (12V), 435 W (24V), 580 W (110V), 400 W (230V).
- Dimensions: 420 x 120 x 360 mm (l x w x h)
- Hose from toilet to Sani-Processor:  $\varnothing$  102 mm, maximum length 4 metres.
- Hose from Sani-Processor to holding tank:  $\varnothing$  19 mm, maximum length 20 metres.
- The holding tank may be maximum 4 metres higher than the Sani-Processor
- Washbasin/bidet connections:  $\varnothing$  40 mm
- Weight: 4.8 kg
- Pump capacity: approx. 50 l/min at 4 m head.

- ① Hose connection  $\varnothing$  102 mm (SLVBR100K)
- ② Hose connection  $\varnothing$  40 mm (SLVBR40K or HA3060)
- ③ Hose connection HA1338

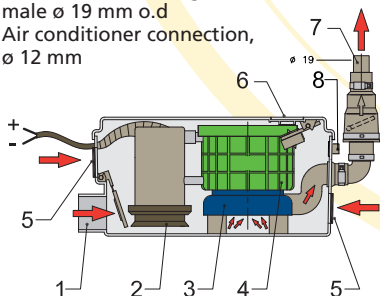


**GWDS**

## NO MORE BLOCKAGES OR SMELLS WITH THE VETUS "GREY WATER DISCHARGE SYSTEM"

In many boats it is impossible to achieve a natural fall from the shower tray or washbasin outlet into the waste water tank. In these cases, the Vetus grey water discharge system (GWDS) is the answer. The GWDS consists of a watertight housing with a discharge pump and automatic float switch. The pump produces very low noise. A non-return valve is fitted in the discharge line. The bottom of the GWDS assembly must be at least 6 cm below the shower tray or washbasin outlet. The waste water tank can be located up to 4 metres above the GWDS unit or up to 20 metres away from it. Instead of pumping the waste water into the holding tank, it can of course also be discharged directly overboard. If the system becomes clogged, the housing cover can be easily removed to clear the blockage.

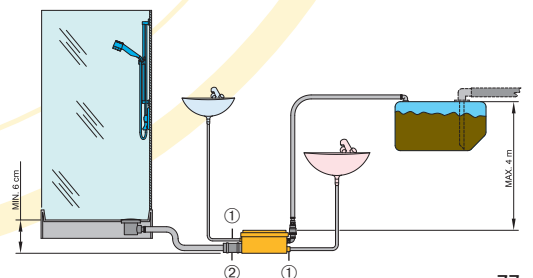
1. Shower or washbasin connection  $\varnothing$  40 mm
2. Float switch
3. Discharge pump
4. Electric motor
5. Washbasin connection,  $\varnothing$  32 or 40 mm
6. Breather
7. Waste water discharge connection: male  $\varnothing$  19 mm o.d.
8. Air conditioner connection,  $\varnothing$  12 mm



### TECHNICAL SPECIFICATIONS

- Available for 12 or 24 Volt DC or 230 Volt/50 Hz. or 120 Volt/60 Hz.
- Nominal power consumption: approx. 340 W (12V), 350 W (24V), 600 W (120V), 250 W (230V).
- Dimensions: 300 x 165 x 145 mm (l x w x h)
- Pump output: Approx. 44 litres/min.
- Outlet discharge to holding tank:  $\varnothing$  19 mm
- Inlet connections from shower or washbasin:  $\varnothing$  32 or 40 mm
- Weight: 3.5 kg
- Maximum permissible water temperature: 35° C.

For VETUS sanitary hoses (code: SAHOSE....) please see page 88  
 Hose connectors ① HA1338 and ② HA3060 are shown on page 91.



# ELECTRIC MARINE TOILETS

All VETUS toilets are equipped with an electric pump, which will macerate the contents and evacuate it in about 7 seconds. They are available in 12 or 24 Volt DC versions or alternatively, for 120 or 230 Volt AC (not model SMT02). VETUS toilets are both quick and quiet in operation (61dB(A)).

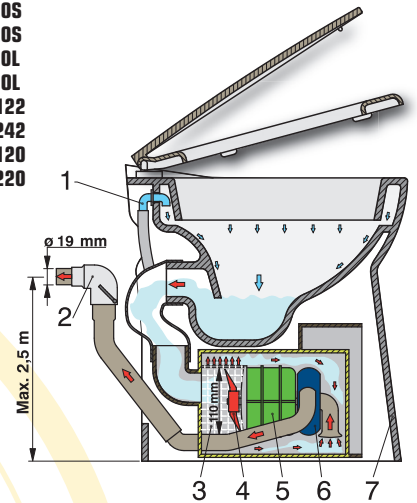
The main features of VETUS electric toilets are:

- A stylish and ergonomic porcelain bowl with an easy clean seat and lid of similar dimensions to a normal domestic toilet.
- The internal diameter of the outlet pipe is only 19 mm. This means that the toilet can be located in any convenient position aboard and can be connected simply to the waste water tank, using VETUS sanitation hose, type SAHOSE (see page 88).
- All 12 and 24 volt VETUS electric toilets have the following specifications:
  - Models WCL, WCS and SMTO, have a combined pump / macerator unit with a diameter of 96 mm. Model HATO has a separate pump and a 98 mm diameter macerator.

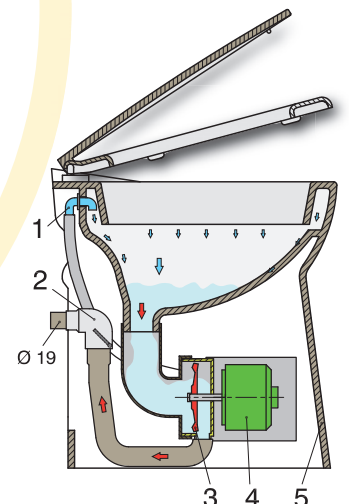
- The pump motor power is 300 Watts and it has a capacity of 36 l/min at 3 metres head
- A dual-flush system. The ECO button on the control panel will flush 1.2 litres of water. The NORMAL button will flush 2.2 litres. By pressing and holding the evacuation button, these toilets can be discharged without flushing. This is particularly useful to prevent overflowing on a heeled sailing boat.
- Supplied as standard with an electronic control panel.
- All 120 and 230 volt AC VETUS electric toilets have the following specifications:
  - A separate pump and a 98 mm diameter macerator.
  - The pump motor power is 500 Watts and it has a capacity of 42 l/min at 3 metres head.
  - A single flush system which flushes approximately 5.5 litres of water.
  - A pneumatically operated push button.
- We recommend that the flush water be drawn from the main pressurized fresh water system. Alternatively, a separate pump and fine filter can be installed to draw seawater from outside the boat.

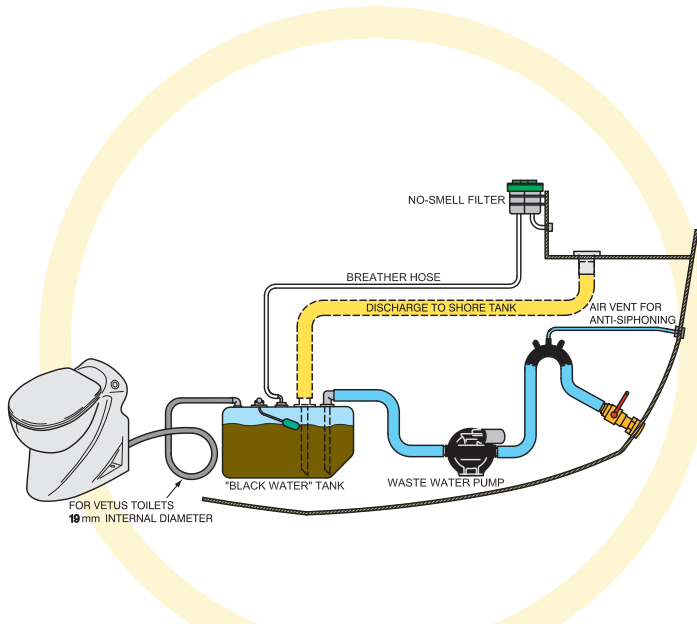


WC120S  
WC220S  
WC120L  
WC220L  
HATO122  
HATO242  
HATO120  
HATO220



SMT0122  
SMT0242  
WC12S2  
WC24S2  
WC12L2  
WC24L2

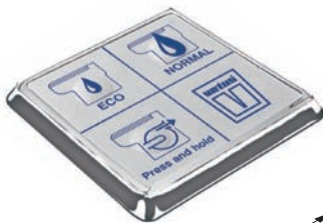




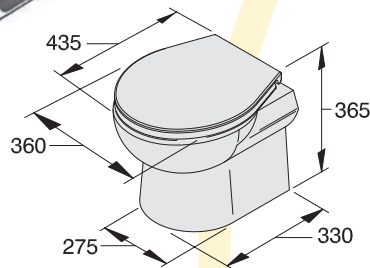
- The waste water holding tank may be positioned up to 3 metres above the toilet discharge connection. The maximum length of  $\varnothing$  19 mm discharge hose can be up to 30 metres.
- Both discharge pump types are easily accessible for occasional cleaning if required. The pump with the separate macerator is provided with a grille to prevent coarse matter reaching the pump.
- All toilets are provided with a water lock and non-return valve in the discharge line.
- The weights are as follows: WCS - 23 kg, WCL - 29 kg, HATO - 28 kg and SMTO2 - 18 kg.
- In many countries, discharging black water in open waters is only permissible if the waste has been macerated first. All VETUS toilets comply with such directives.
- The installation of all toilets is a quick and easy procedure.

**THE ELECTRONIC CONTROL PANEL**

- The panel controls 3 functions: economy flush, normal flush and discharge only.
- It is supplied completely pre-wired and terminates with a plug and 1.5 m cable. This connects to the 1.5 m harness and socket supplied with the toilet.



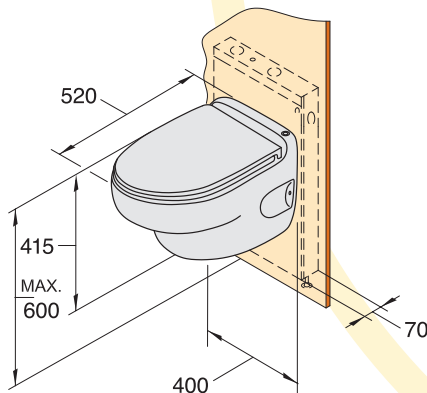
- The panel dimensions are 72 x 72 mm and the build-in depth required is 21 mm.
- The edges of the panel are chromium plated.
- It is supplied with a waterproof gasket and can be easily fitted to a bulkhead.



**SMTO2**



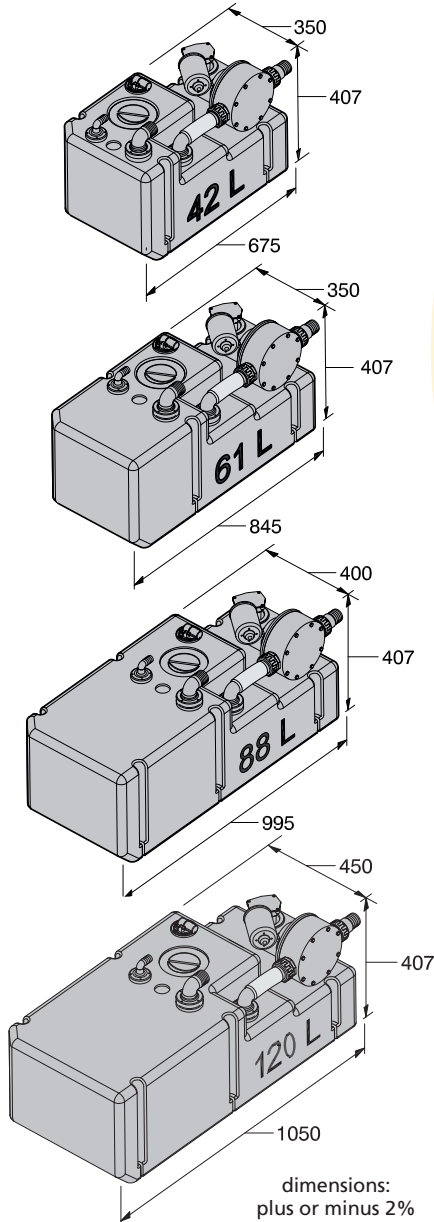
**HATO**



This wall mounted toilet provides a solution where floor space is at a premium and enables toilet installation where a floor standing model would be impractical.



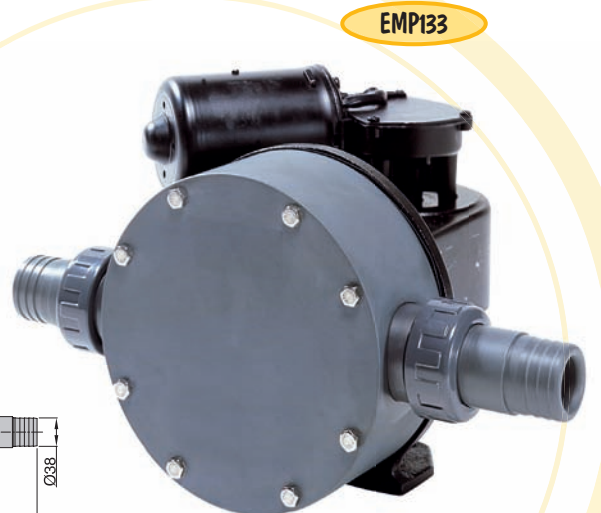
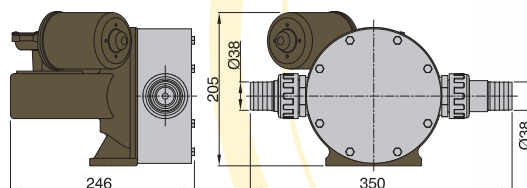
**WASTE WATER TANK SYSTEM**



The tanks are made of odour impermeable polythene. The system comes complete with a VETUS waste water pump, shown below (12 or 24 V), an inspection cover, a tank gauge sender (the 12 or 24 Volt level gauge must be ordered separately, a plastic suction pipe with angled hose connection,  $\varnothing$  38 mm, for discharge from ashore, two securing straps and one  $\varnothing$  19 mm connection for the breather. Angled connectors for the input of waste water must be ordered separately; see pricelist. One hole has already been provided, to connect the inlet fitting. These waste water systems are designed to save on space and installation time and are available with tank capacities of 42, 61, 88 or 120 litres. All input and discharge connections are accessible at the top of the tank. Provided with ISO 8099 identification. Model WWS is not only suitable for storing "black" water, but also for "grey" waste water.

**WASTE WATER/BILGE PUMP**

Ideally suited for pumping "grey" and "black" waste water. This VETUS pump is electrically driven (12 or 24 Volt D.C.). It has a diaphragm with large diameter and a long stroke. VETUS recommends a **diaphragm** type pump because it will readily move semi-solid material such as toilet waste and because any clogging can be remedied very easily. The pump capacity is about 25 litres/minute at zero head. The maximum suction height is 3 metres, the maximum height of the discharge is 5 metres. Power consumption: about 6 A at 12 V and 4 A at 24 V. Because the pump is self-priming, it may even be positioned **above** the waterline if used as a bilge pump. Suitable for hose with  $\varnothing$  38 mm internal diameter. **Additional feature:** The same pumping assembly may be used to discharge bilge water as well.



# RIGID TANKS FOR WASTE WATER

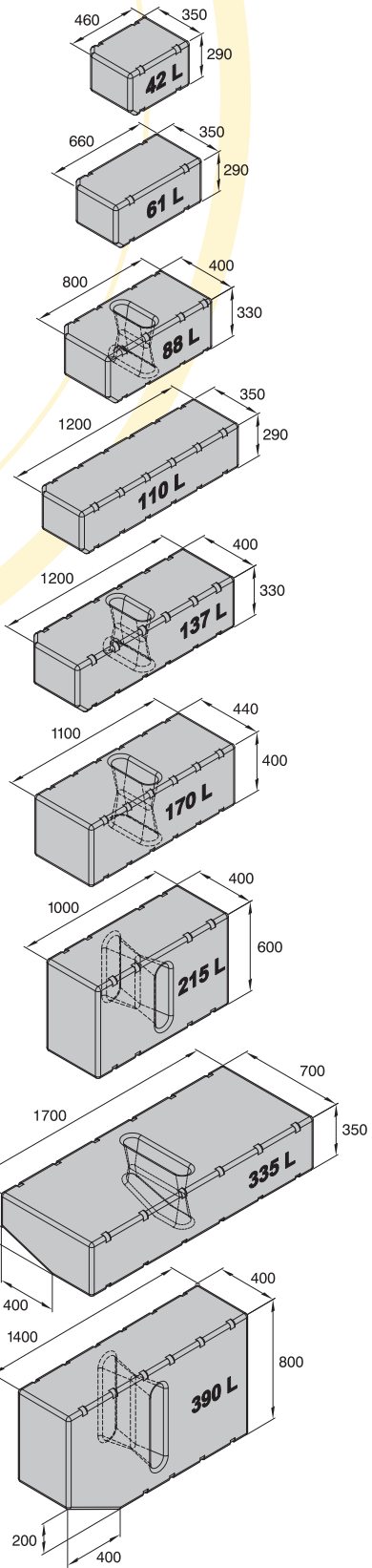
These tanks are provided with ISO 8099 identification.

## BTANK



The discharge of marine toilets ("black water") and of sinks and showers ("grey water") directly overboard in yacht harbours or other sheltered water is more and more restricted nowadays. In order to overcome this problem and yet fully comply with the rules, VETUS has developed a system for temporary onboard storage of waste water. This waste can then be discharged overboard whilst sailing in open water or, preferably, pumped into a holding tank or sewer at a convenient point ashore. These tanks may be installed in existing craft relatively simply, without the necessity to replace the marine toilet. Owing to the special odour impermeable material used and to the thick wall construction, these VETUS waste water tanks are designed for the temporary storage of "black water" (toilet waste). The waste water tank will need an inlet connection for each toilet, shower, washbasin etc. A connection kit BTKIT, "no-smell" sanitary hoses and angled connectors for inlet and tank ventilation in various diameters may be ordered separately to suit your requirements. Please note that to prevent unpleasant odours, we recommend the use of separate tanks for "black water" and "grey water" waste. When a marine toilet is connected to the tank the use of VETUS odour tight sanitation hose is an absolute must. Other accessories such as deck plates, extraction pipes, hoses etc. may be ordered separately as required. The use of a VETUS diaphragm pump is recommended to empty the tank. This type of pump is not prone to clogging with semi-solid waste. An electric version is shown on page 80.

These VETUS tanks are made in 9 different shapes and sizes, with contents of about 42, 61, 88, 110, 137, 170, 215, 335 or 390 litres.



## BULKHEAD MOUNTED WASTE WATER TANKS

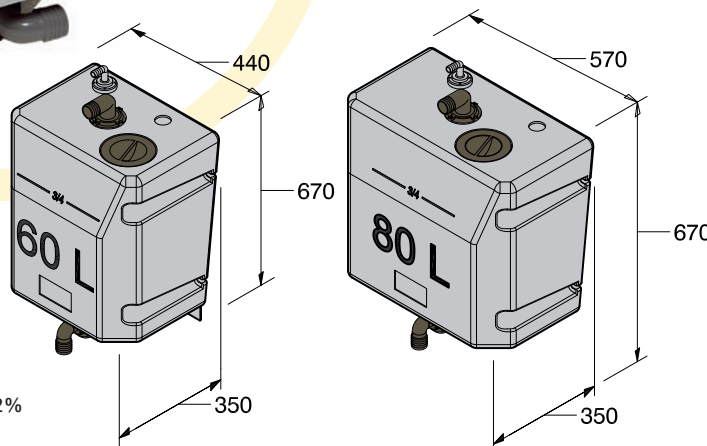


## WWW

These tanks are available in two sizes, with capacities of approximately 60 or 80 litres. The tanks are made of odour impermeable polythene and the contents level can be seen from outside. They come complete with the following components installed:

- Suction pipe with  $\varnothing$  38 mm angled hose connector, for connection to deck plate
- Angled hose connector,  $\varnothing$  38 mm, for discharge
- Inspection cover
- Angled hose connector,  $\varnothing$  19 mm, for tank ventilation (breather)

Angled inlet connectors can be ordered separately; see pricelist. One hole has already been provided, to connect the inlet fitting. These tanks are suitable for mounting under the side decks, above the waterline. When permitted, the contents of the tank can be gravity discharged at sea, without the assistance of a pump. Simply opening the sea cock will empty the tank. Provided with ISO 8099 identification.



dimensions: plus or minus 2%

dimensions: plus or minus 2%

The 88, 137, 170, 215, 335 and 390 litre models are provided with baffles, as a standard construction element.

## WASTE WATER CONTROL PANEL



This newly developed waste water control panel provides total management of the holding tank system. It indicates the contents level in the tank and controls the pump out, either automatically or manually.

The panel is connected to a VETUS level sensor in the tank (WWSSENSOR). It then indicates by means of LEDs, when the tank is 25%, 50%, 75% or 100% full. When the tank is completely full, the LED will flash. The control panel has a combination lock, which prevents the pump from being activated accidentally or without permission. Once the security code is entered, the pump can be operated fully automatically or with manual override. If the "auto" function is selected, the pump will discharge the tank automatically once it is completely full. A switched outlet on the panel can also be connected to a relay in the toilet control circuit. Therefore, if the tank is full and remains full, it is possible prevent the toilet from being flushed further. The panel can also be connected to a remotely controlled ball valve which will open before the pump starts. In this case a LED indicates when the valve is closed. Once the tank is empty, the pump will switch off automatically, in order to prevent dry running. To prevent cycling on and off due to movement of the boat, the tank must register full for a while before the pump out commences. The Waste Water Control Panel is supplied without pump, valve or level sensor.

### Technical data:

Voltage	: 12 or 24 Volt.
Current consumption: Panel in stand-by	: 4 mA
Electric pump	: 10 A max
Remotely controlled ball valve	: 5 A max
External alarm	: 1 A max
Level sensor to be connected	: VETUS type WWSSENSOR A
Panel dimensions	: 85 x 85 mm.
Build in depth	: 40 mm.

## NO-SMELL FILTERS FOR TOILET WASTE TANKS ("BLACK WATER")

Each waste water tank requires an air breather line, through which unpleasant odours may escape. This can be prevented by the installation of a VETUS No-Smell filter into the breather line. The No-Smell filter element contains a special odour-absorbing material. The filter can be installed very easily. Model NSF is available with connectors for  $\varnothing$  16 mm, 19 mm, 25 mm or 38 mm breather hose.

The special VETUS waste water hose, made of reinforced PVC is excellently suited as breather hose. The filter element is exchangeable and should be renewed once a year.



**NSF**  
Dimensions: l x w x h:  
148 x 150 x 162 mm.

**NSFS**  
Model NSFS is suitable for  $\varnothing$  16 mm vent hose only.  
Dimensions: l x w x h:  
107 x 111 x 111 mm.

## VACUUM OPERATED VENT VALVE, TYPE VRF

If a waste water tank is being emptied using a powerful shore based pump-out station, it is possible that insufficient air enters through the vent line causing the tank to implode. To prevent this possibility, this VETUS valve type VRF will automatically open with the increasing vacuum, thus letting air into the tank. Model VRF 56 has a free flow area of more than 1100 mm<sup>2</sup> and thus fulfils the requirements of the relevant ISO 8099 standard. The hole in the tank must be  $\varnothing$  56 mm, which is the same size as the hole for a VETUS extraction pipe. This valve is an indispensable safety factor if the vent line has a smaller diameter than  $\varnothing$  19 mm, or for tanks of more than 400 litres, a vent line less than  $\varnothing$  38 mm. By using this valve, the necessity to fit a large diameter vent line is avoided, thus saving cost and space whilst still meeting the ISO 8099 standard. This valve is made entirely from synthetic materials and therefore absolutely corrosion-free.



## THREE-WAY BALL VALVE

made of plastic,  
 $\varnothing$  38 mm



**VALVE38**

## Y-CONNECTOR

made of plastic,  
 $\varnothing$  38 mm



**YCONN**

## EXTRACTION PIPES

For both "grey" and "black" waste water tanks, VETUS can supply extraction pipes with the following features:

- For electrically or manually operated diaphragm pumps or direct connection to deck plate.
- With angled or straight connections of  $\varnothing$  38 mm
- With a tube length of either 370 or 780 mm (which can be cut to the required length).



**WTS**

## ANTI-SIPHONING BREATHER-KIT.

Breather, suitable for  $\varnothing$  38 hose. Plastic housing. Comes complete with skin fitting, hose clamps and 2 metres of breather hose.



**AIRVH38**

## CONNECTION KIT CONSISTING OF:

- 2 securing straps
- 1 inspection lid
- 1 key



**BTKIT**

## ANGLED FITTINGS

Angled synthetic fittings, suitable for VETUS flexible tanks (code FT) or rigid tanks (code RT). Suitable for hoses with internal diameters of  $\varnothing$  13 mm,  $\varnothing$  16 mm,  $\varnothing$  19 mm,  $\varnothing$  25 mm,  $\varnothing$  35 mm or  $\varnothing$  38 mm. Required hole size:  $\varnothing$  42 mm for flexible tanks,  $\varnothing$  43 mm for rigid tanks.



**FT**

**RT**

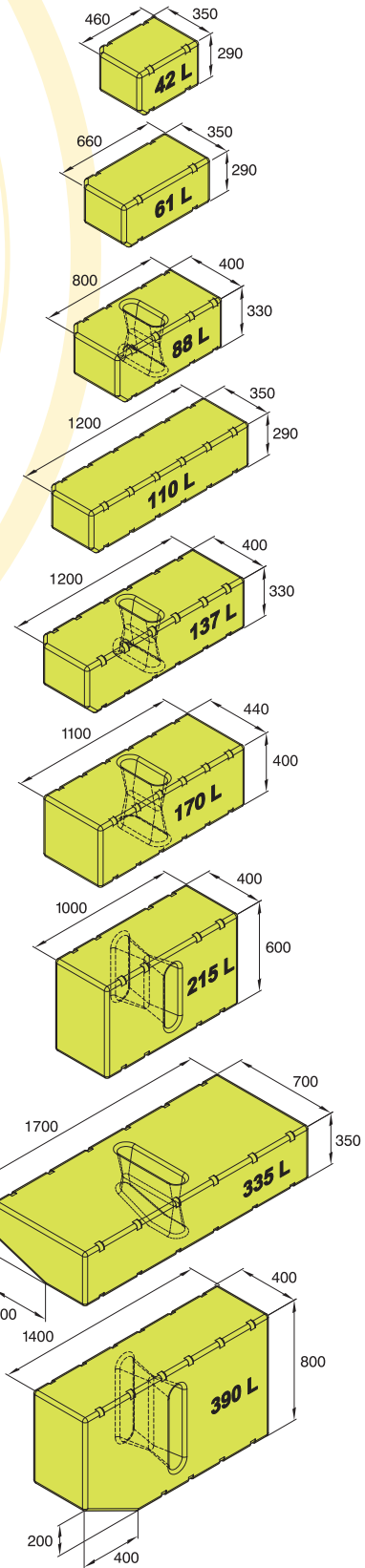
# RIGID TANKS FOR DRINKING WATER

These VETUS tanks are made in 9 different shapes and sizes, with contents of approximately: 42, 61, 88, 110, 137, 170, 215, 335 or 390 litres.

Colour: green. Material: taste-free and odourless synthetic material (food quality). No rust. The tank can be cleaned (algae, etc.) through the inspection lid. The liquid can be seen from outside; the most accurate check there is!

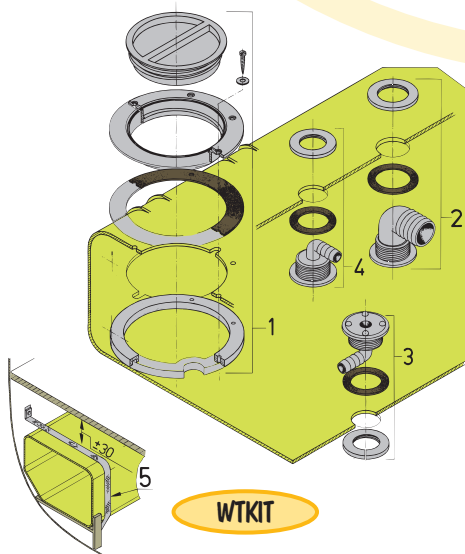


**WTANK**



### CONNECTION KIT

- Inspection lid (1)
- Right angle connection RT38B for filling hose, Ø 38 mm (2)
- Right angle connection RT16B to water pump, Ø 16 mm (3)
- Right angle connection RT16B for ventilation, Ø 16 mm (4)
- Two mounting straps (5)
- T-joint, for interconnection, Ø 16 mm (6)
- For the 88, 137, 170, 215, 335 and 390 l. tanks, extra inspection lid kits are available.



**WTKIT**



**Additional inlet and outlet connectors in various sizes are available separately. Please see price list**

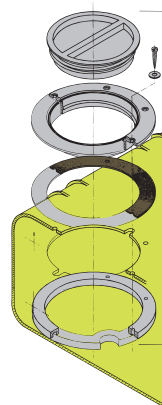


Overall diameter 156 mm  
Cut out diameter 115 mm

### INSPECTION LID

Inspection lid kit, complete with gasket, counterflange and fastenings.

**WTIKIT**



**Only suitable for (waste) water tanks, not for fuel tanks.**

dimensions: plus or minus 2%

The 88, 137, 170, 215, 335 and 390 litre models are provided with **baffles**, as a **standard** construction element.

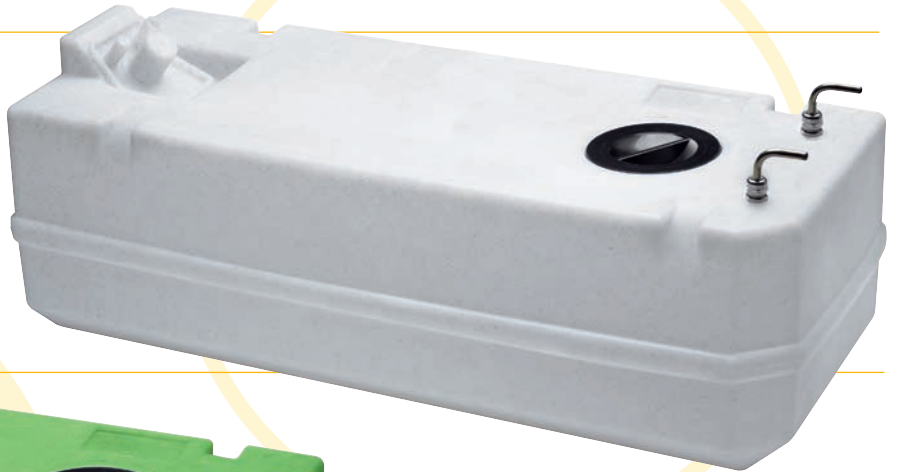
This new range of rigid VETUS tanks is designed for diesel fuel, drinking water and black or grey waste water. The high-grade linear polythene materials used are the same as all other rigid VETUS tanks and they are available with capacities of 40, 60 or 88 litres. These new tanks are provided with the necessary hose connectors and with an inspection lid, all of which are located on the top of the tank. The centre point for an SAE flange gauge sender is incorporated in the moulding together with 5 blind bolt holes. The relevant gauge sender should be ordered separately and the appropriate hole cut in the tank.

**These tanks will save considerable installation time!**

**Diesel fuel tanks** are supplied with the following connections:

Fixed hose connector  $\varnothing$  38 mm for filling  
Fixed hose connector  $\varnothing$  16 mm for the breather line.

Rotating hose connectors  $\varnothing$  8 mm or  $\varnothing$  10 mm with pick-up pipe, for fuel suction.  
Rotating hose connectors  $\varnothing$  8 mm or  $\varnothing$  10 mm for fuel return.



**Drinking water tanks** are supplied with the following connections:

Fixed hose connector  $\varnothing$  38 mm for filling  
Fixed hose connector  $\varnothing$  16 mm for the breather line.

Rotating hose connector  $\varnothing$  13 mm with pick-up pipe, for water suction.  
These tanks come complete with a screw down inspection lid installed.

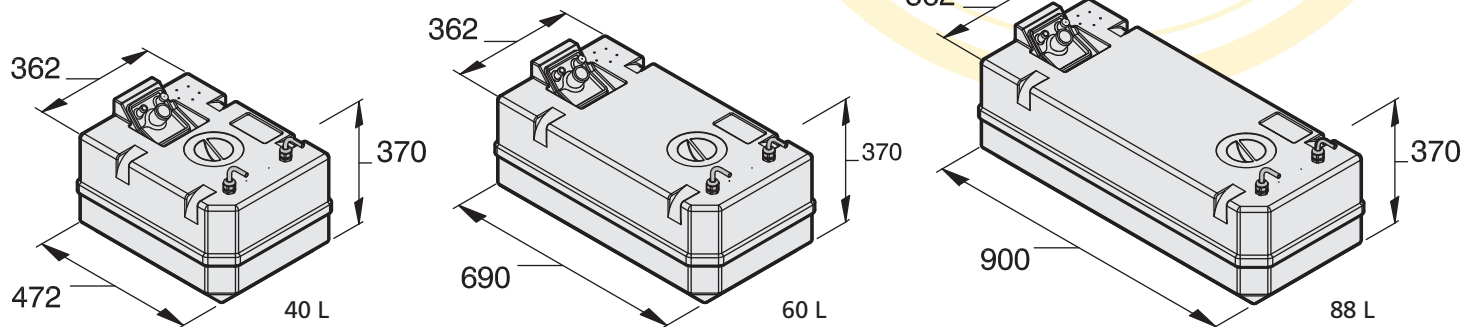
**Waste water tanks** are supplied with the following connections:

Fixed hose connector  $\varnothing$  19 mm for the breather line. Rotating hose connector  $\varnothing$  38 mm with pick-up pipe, for waste water suction.

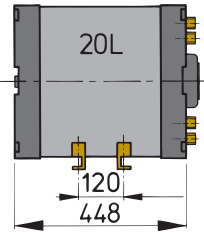
A  $\varnothing$  42 mm hole is provided for easy installation of an inlet fitting, type RT..B. This should be ordered separately according to the inlet hose diameter. If required, additional inlet fittings may also be installed. These tanks come complete with a screw down inspection lid installed. See page 82.



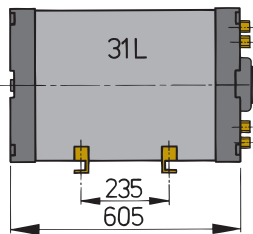
Dimensions: plus or minus 2%



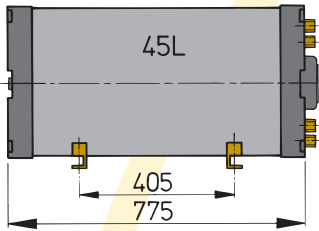
The engine coolant is circulated between the inner and the outer jacket of the VETUS calorifier, which heats up the fresh water inside the inner boiler. The insulation material used is of such high efficiency that the loss of heat in the fresh water is only around 12°C per 24 hours. VETUS calorifiers may be installed either horizontally or vertically. A connection set and a 1Kw electric heating element are supplied as standard.



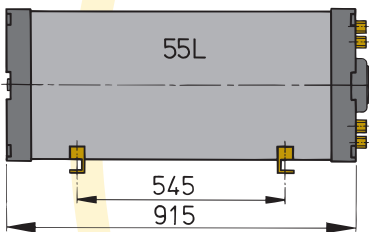
Contents of fresh water: 20 l.  
Contents of coolant: 4 l.



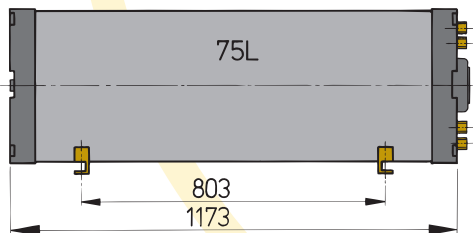
Contents of fresh water: 31 l.  
Contents of coolant: 7 l.



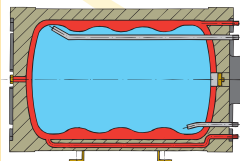
Contents of fresh water: 45 l.  
Contents of coolant: 7,5 l.



Contents of fresh water: 55 l.  
Contents of coolant: 8 l.

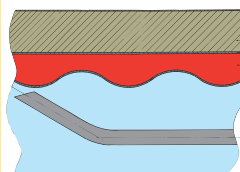


Contents of fresh water: 75 l.  
Contents of coolant: 9,5 l.



blue = fresh water  
red = coolant

### THE DOUBLE WALL OF THE VETUS CALORIFIER



- 1: insulation material
- 2: outer jacket
- 3: coolant
- 4: inner jacket
- 5: freshwater

The double walled VETUS calorifiers have a heating surface which is 5-7 times greater than a conventional heating spiral. This means that the fresh water will heat up 5-7 times faster than with a traditional calorifier. These calorifiers cannot be used with an **oil-cooled** Vetus Deutz engine. Please consult your engine dealer.

### Technical data:

Basic materials:	
Inner boiler	: stainless steel, AISI 304
Outer jacket	: stainless steel, AISI 304
Insulation	: polyester foam, 35 mm thickness
Connections:	
Engine coolant	: G 1/2
Fresh water	: G 1/2
Heating element	: G 1 1/4
Setting of relief valve fresh water	: 4 bar (56 lbs/sq.inch)

**A CONNECTION SET AND A 1KW ELECTRIC HEATING ELEMENT ARE SUPPLIED AS STANDARD.**

### CONNECTION SET

The connection set consists of:  
4 hose pillars G $\frac{1}{2}$  - 16 mm for  $\varnothing$  16 mm water hose.  
1 T-piece.  
1 pressure relief valve (4 bar).  
1 non-return valve with drain points.

### HEATING ELEMENT

Electric heating element specification:  
1000 Watt, 230 Volt. Adjustable thermostat (40 - 80° C).  
Male thread size, ISO 228/1 G1 1/4  
Screw-in length of element is 300 mm.

**Optional electric heating elements:**  
500 Watt, 230 Volt.  
1000 Watt, 120 Volt.



### CALORIFIER HOSE

(see page. 88)

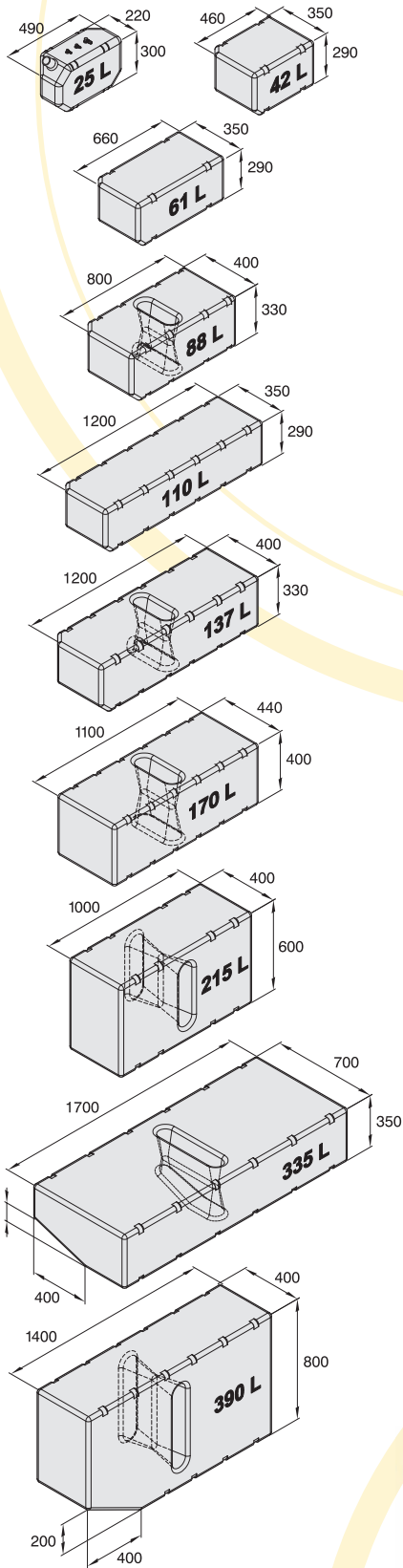


We can also supply – in lengths of 10 metres – non-toxic hose, which is resistant to temperatures of up to 160° C and a maximum pressure of 8 bar (112 psi). This hose is very durable and can be used both for the hot fresh water and for the coolant.  
Inside diameter: 13 mm, outside diameter: 23 mm.  
Inside diameter: 16 mm, outside diameter: 26 mm.

# RIGID TANKS FOR DIESEL FUEL

The 25 litre tank comes complete with all connections and 2 mounting straps.

These VETUS tanks are manufactured in 10 different shapes and sizes, with contents of approximately; 25, 42, 61, 88, 110, 137, 170, 215, 335 or 390 litres.



Dimensions: plus or minus 2%

The 88, 137, 170, 215, 335 and 390 litre models are provided with **baffles**, as a **standard** construction element.

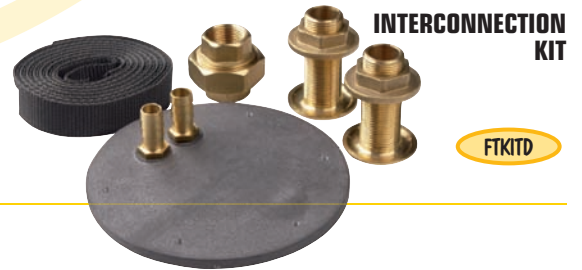
## FTANK



VETUS fuel tanks are manufactured of Linear Polythene. They are much less liable to explode than metal tanks and there is no possibility of rust formation. The fuel level can be seen from the outside; the most reliable check there is!

### TWIN TANK INSTALLATION

VETUS fuel tanks can be interconnected by means of an interconnection kit (optional supply).



### INTERCONNECTION KIT

FTKITD

### CONNECTION KIT FOR DIESEL FUEL TANKS

Three different connection kits may be supplied: two types for smaller engines and one for more powerful units. Each connection kit consists of an **aluminium cover with the following connections for:**



FTKITA	FTKITB	FTKITC
- filling, Ø 38/Ø 50 mm (rotates through 360°)	- filling, Ø 38/Ø 50 mm (rotates through 360°)	- filling, Ø 38/Ø 50 mm (rotates through 360°)
- ventilation, Ø 16 mm	- ventilation, Ø 16 mm	- ventilation, Ø 16 mm
- blind cover for tank gauge sender	- blind cover for tank gauge sender	- blind cover for tank gauge sender
- supply line, Ø 8 mm	- supply line, Ø 10 mm	- supply line, Ø 15 mm
- return line, Ø 8 mm	- return line, Ø 10 mm	- return line, Ø 15 mm

**THE REQUIRED CONNECTION KIT SHOULD BE ORDERED SEPARATELY FROM THE TANK**

### WATER SEPARATOR/ FUEL FILTER

For maximum separation of dirt and water from fuel. (See page 136).

See page 71 for fuel level indicators.



### HOSE

Please see page 88 and 89 for our selection of supply, return, air breather and filler hoses for diesel fuel.

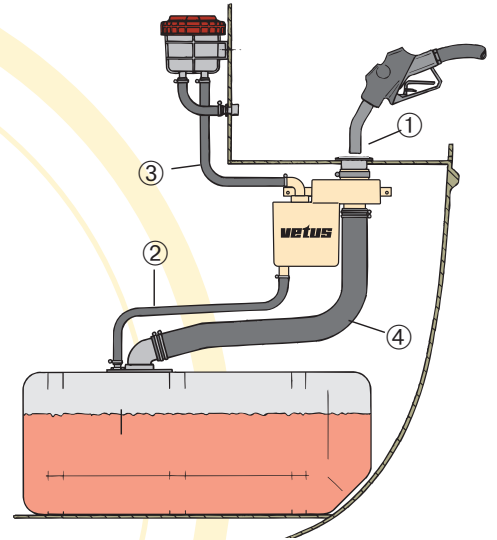
Filler caps and ventilation nipples, see page 90 and 91.





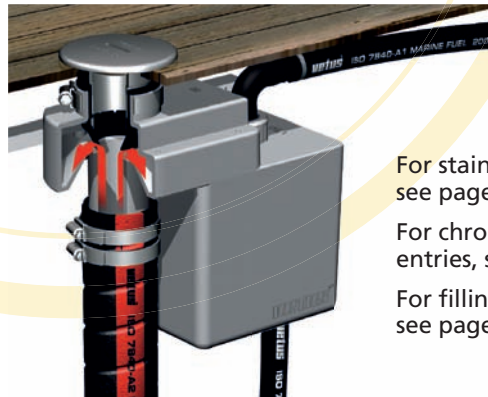
The VETUS "Splash-Stop" is directly connected to a deck entry plate, with a diameter of 38 or 51 mm (optional equipment) ①. It ensures that overflowing diesel fuel and froth will not come out of the deck entry - soiling your deck and polluting the water -, but will be neatly caught inside the reservoir (with a capacity of approx. 2 litres). Excessive fuel will flow back into the main tank through connection ②. This connection also serves as the necessary tank ventilation. The breather line to outside is to be installed to connection ③.

A VETUS diesel smell filter may be installed into this breather line as well. If the diesel smell filter is positioned well **above** the deck, the breather line may exit below the deck level, if so required. Supplied with connections for Ø 38 mm or for Ø 51 mm fuel filling hose ④.



**An invaluable accessory for both motor and sailing boats.**

- FS3816** VETUS deck entry, Ø 38 mm  
Filler hose connection: Ø 38 and Ø 51 mm.  
Breather connection: Ø 16 mm
- FS5116** VETUS deck entry, Ø 51 mm  
Filler hose connection: Ø 38 and Ø 51 mm.  
Breather connection: Ø 16 mm
- FS5125** VETUS deck entry, Ø 51 mm  
Filler hose connection: Ø 51 mm.  
Breather connection: Ø 25 mm

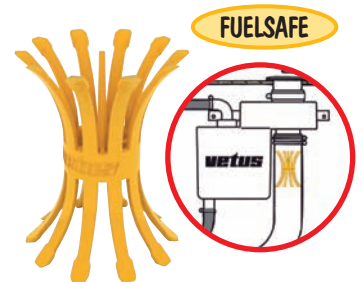


For stainless steel deck entries, see page 91.  
For chromium plated brass deck entries, see page 91.  
For filling and ventilation hoses, see page. 88 and 89.

**FUEL SAFE (PATENT PENDING)**

With ever increasing fuel prices, the theft of fuel from boats is becoming a far more common occurrence. A VETUS FUEL SAFE overcomes this risk simply and cheaply, by making it impossible to insert a siphon hose into the tank through the filling hose. Think about the value of fuel in your tank or the inconvenience of running out unexpectedly?

- Installation of this safety device is very simple
- No dismantling is required
- The synthetic packing material is also used to insert the device.
- Suitable for hoses with internal diameters of 38 mm (1 1/2") and 51 mm (2").
- Material: Petrol and diesel resistant synthetic.
- Dimensions: Ø 55 mm x 72 mm.



Dimensions:  
l x w x h: 148 x 150 x 162 mm.

**NSFD**

**NO-SMELL FILTERS FOR DIESEL TANKS**

Through the breather line, which is required for all fuel tanks on board boats, unpleasant diesel smells may escape. Installation of a VETUS no-smell filter is the perfect remedy to this problem. The filter housing features Ø 16 mm, Ø 19 mm or Ø 25 mm connectors and the VETUS fuel hose (see page 88) is suitable as a breather line. The filter element can be replaced and must be exchanged once a year.

**Attention:** diesel fuel and froth must NOT enter into the filter housing and its element. It is therefore imperative that the no-smell filter is installed in combination with the VETUS Splash-Stop, shown above.. As the name already indicates, the VETUS diesel smell filter should NOT be used for petrol tanks.



**NSFDS**

Model NSFDS is suitable for Ø 16 mm vent hose only.  
Dimensions: l x w x h:  
107 x 111 x 111 mm.

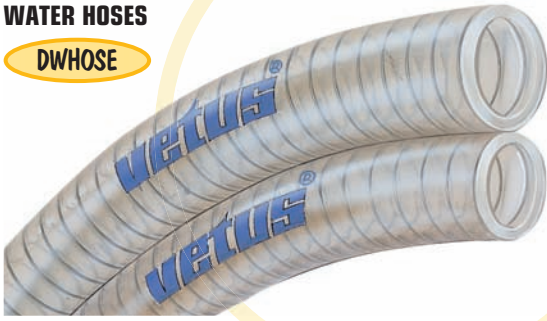


# HOSES FOR MARINE APPLICATION

VETUS marine hoses fulfil all current legislation for use on board. On top of that, they are highly flexible and resistant against a variety of internal or external influences.

## WATER HOSES

DWHSO



Suitable for transportation of drinking and grey water on board, both suction and pressure. Made of transparent PVC with spiralled steel inlay.

Tasteless and non-toxic. Temperature-proof between -5 and +65°C. Available in coils of:  
 Ø 10 mm - Ø 38 mm - 30 m  
 Ø 40 mm - Ø 50 mm - 10 m

Internal dia	External dia	Weight	Pressure in bar			Bending radius
			20°C	40°C	65°C	
10 mm 3/8"	16 mm	0,16 kg/m	7	5	3	20 mm
12 mm 1/2"	18 mm	0,18 kg/m	7	5	3	25 mm
16 mm 5/8"	22,4 mm	0,23 kg/m	6	4	2,5	35 mm
20 mm	26,8 mm	0,34 kg/m	5	3	2	50 mm
25 mm 1"	33 mm	0,51 kg/m	5	3	2	60 mm
30 mm 1 1/16"	38,4 mm	0,60 kg/m	4,5	3	1,5	70 mm
32 mm 1 1/4"	40,4 mm	0,65 kg/m	4,5	3	1,5	75 mm
35 mm 1 3/8"	44 mm	0,73 kg/m	4	2	1	80 mm
38 mm 1 1/2"	47 mm	0,80 kg/m	4	2	1	90 mm
40 mm 1 4/16"	49,4 mm	0,87 kg/m	3	1	0,7	95 mm
45 mm 1 3/4"	55 mm	1,10 kg/m	3	1	0,7	110 mm
50 mm 2"	60 mm	1,20 kg/m	3	1	0,7	125 mm

### MEETS THE HIGHEST CE STANDARD: ISO 7840 MARINE FUEL A1

## FUEL HOSES

FUHSO



For transportation of fuel, from tank to e.g. fuel filter, or to serve as ventilation line. Available as quality type A1, suitable for both petrol and diesel. Inside made of NBR rubber, outside of CR rubber. Provided with an inlay of woven synthetic fabric.

Internal dia.	External dia.	Weight	Max. pressure	Bending radius
6 mm 1/4"	13 mm	0,16 kg/m	3,4 bar	27 mm
8 mm 5/16"	16 mm	0,20 kg/m	3,4 bar	35 mm
10 mm 3/8"	18 mm	0,24 kg/m	3,4 bar	45 mm
13 mm 1/2"	22 mm	0,28 kg/m	2,5 bar	60 mm
16 mm 5/8"	25 mm	0,33 kg/m	2,5 bar	70 mm
19 mm 3/4"	27 mm	0,58 kg/m	2,5 bar	80 mm
25 mm 1"	35 mm	0,70 kg/m	2,5 bar	110 mm

Available in coils of 30 m.

Fuel hoses which fulfil the requirements of Marine Fuel A1 have been successfully subjected to a fire test for 2.5 minutes and have a maximum permeability of 4 grams/m<sup>2</sup>/hour. Fuel hoses which fulfil the requirements of Marine Fuel A2 have been successfully subjected to a fire test for 2.5 minutes and have a maximum permeability of 12 grams/m<sup>2</sup>/hour.

## WASTE WATER HOSE

WWHSO



Made of PVC, coloured white, with steel spiral inlay. Suitable for temperatures of between -5 °C and +60 °C.

**Available in coils of:**  
 30 m - ø 8 mm to ø 38 mm  
 10 m - ø 45 mm

Internal dia.	External dia.	Weight	Max. pressure	Bending radius
16 mm 5/8"	22 mm	0,20 kg/m	9,5 bar	60 mm
19 mm 3/4"	25 mm	0,30 kg/m	8,5 bar	75 mm
25 mm 1"	32 mm	0,40 kg/m	7 bar	120 mm
38 mm 1 1/2"	46 mm	0,60 kg/m	6 bar	170 mm
45 mm 1 3/4"	53 mm	0,70 kg/m	5,5 bar	280 mm

## IMPERMEABLE SANITARY HOSES "NO-SMELL"

SAHSO



Especially recommended for transportation of biological waste, e.g. in combination with (marine) toilet installations. Made of SBR rubber with inlays of woven synthetic fabric and steel spiral. Withstands temperatures of between -40 °C and +70 °C. Available in coils of 20 m.

Internal dia.	External dia.	Weight	Max. pressure	Bending radius
16 mm 5/8"	26 mm	0,45 kg/m	3 bar	50 mm
19 mm 3/4"	29 mm	0,55 kg/m	3 bar	65 mm
25 mm 1"	36 mm	0,72 kg/m	3 bar	75 mm
38 mm 1 1/2"	48 mm	1,15 kg/m	3 bar	100 mm
102 mm 4"	115 mm	3,86 kg/m	3 bar	250 mm

### AN ABSOLUTE MUST FOR WASTE WATER TANKS ("BLACK" WATER)

## HOSE FOR CALORIFIERS AND HOT WATER TRANSPORT

WHHSO



Suitable for drinking water and temperature resistant between -30°C and +160°C. Therefore most suited for use with calorifier and hot water systems. Available in coils of 10 m. Made of EPDM rubber with an inlay of woven synthetic fabric.

Internal dia.	External dia.	Weight	Max. pressure			Bending radius
			25°C	50°C	75°C 100°C	
13 mm 1/2"	23 mm	0,37 kg/m	8	6	5 3	95 mm
16 mm 5/8"	26 mm	0,43 kg/m	8	6	5 3	110 mm

## HOSE FOR BLOWERS (VENTILATORS)

BLHSO



This type of hose is made of a woven glass fibre fabric, impregnated with PVC. Suitable for VETUS blowers. Withstands temperatures of between -20 °C and +100 °C.

**Internal dia.mm: 75**

**Bending radius**  
 0.6 x internal diameter

## HOSES FOR MARINE APPLICATION

Suitable for fluids in closed heating and/or cooling systems, such as air conditioning, central heating or combined cooling/heating systems. Temperature resistant between +3° C and +80° C. For transportation of water and cooling fluids.

Available in coils of 20 m. Made of EDPM rubber with inlay of woven reinforcement material. When used with air conditioning units, an insulating sleeve is required in order to avoid condensation on the outer surface of the hose. This is made of a combination of polythene and rubber, with a closed cell structure, and is available in 2 metre lengths.

Internal dia.	External dia.	Weight	Max. pressure	Bending radius
16 mm 5/8"	30 mm	0,6 kg/m	1,5 bar	112 mm
25 mm 1"	39 mm	0,8 kg/m	1,5 bar	175 mm

Ext. dia. of insulating sleeve; 47 mm respectively 60 mm

### HOSE FOR AIR CONDITIONING, HEATING AND COMBINED COOLING/ HEATING UNITS



CCHOSE

#### Applications:

- Suction and transportation of cooling water from outside (such as, connection skin fitting - cooling water strainer - cooling water pump)
- Transportation of warm cooling water (e.g. between engine and keel cooler)

#### Cooling water hose

- Suitable for suction and pressure
- Suitable for salt and fresh water
- Suitable for all cooling fluids
- Temperature resistant between -30° C and +120° C
- Made of EPDM-rubber, with synthetic fabric and spiralled steel reinforcement
- Operating pressure: 2,5 bar maximum

Internal dia.	External dia.	Weight	Max. pressure	Bending radius
19 mm 3/4"	28 mm	0,39 kg/m	2,5 bar	29 mm
25 mm 1"	34 mm	0,51 kg/m	2,5 bar	38 mm
32 mm 1 1/4"	41 mm	0,71 kg/m	2,5 bar	48 mm
38 mm 1 1/2"	47 mm	0,88 kg/m	2,5 bar	57 mm
51 mm 2"	60 mm	1,15 kg/m	2,5 bar	77 mm

Available in coils of 20 m

### COOLING WATER HOSE



MWBOSE

This type of hose is made of NBR rubber with spiralled steel inlay. Suitable for both petrol and diesel fuels. Temperature resistant between -30°C and +100°C.

Internal dia.	External dia.	Weight	Max. pressure	Bending radius
38 mm 1 1/2"	50 mm	1,1 kg/m	4 bar	76 mm
51 mm 2"	63 mm	1,5 kg/m	4 bar	102 mm

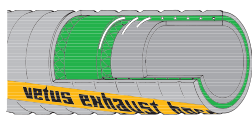
### FUEL FILLING HOSE (EXTREMELY FLEXIBLE)



FFHOSE

Meets the requirements of **SAE J 1527 and ISO 7840-MARINE FUEL AZ**. Extremely flexible. Available in coils of 20 m.

Thanks to increased spiral reinforcement and a more supple type of rubber, VETUS exhaust hoses are now even stronger, as well as more flexible. Exhaust hoses with an internal diameter of up to Ø 152 mm inclusive, have a bending radius of no more than 1.5 x the diameter. Exhaust hoses with an internal diameter of more than Ø 152 mm, have a bending radius of two times the diameter of the hose. By virtue of this increased flexibility, valuable installation time will be saved. VETUS exhaust hoses have Lloyd's Register of Shipping approval and also meet the requirements of the SAE J2006 R2 standard. They are temperature resistant between -30° and +100° C, with brief peak temperatures of 115° C. VETUS exhaust hoses approved by R.I.N.A and which meet the ISO 13363 standard are available as an option. Please see price list.



In order to reduce back pressure in the engine, the inside of all VETUS exhaust hoses is **completely flush and smooth**.

Internal diameter	External diameter	Bending radius	Weight	Max. pressure
30 mm 1 1/8"	38 mm	45 mm	0,45 kg/m	4 bar
40 mm 1 3/8"	48 mm	60 mm	0,69 kg/m	4 bar
45 mm 1 7/8"	53 mm	68 mm	0,76 kg/m	4 bar
51 mm 2"	59 mm	77 mm	0,86 kg/m	4 bar
57 mm 2 1/4"	65 mm	86 mm	0,96 kg/m	3,3 bar
60 mm 2 3/8"	68 mm	90 mm	1,00 kg/m	3,3 bar
65 mm 2 7/8"	73 mm	98 mm	1,08 kg/m	3,3 bar
76 mm 3"	84 mm	114 mm	1,26 kg/m	3,3 bar
90 mm 3 1/2"	98 mm	135 mm	1,68 kg/m	2 bar
102 mm 4"	110 mm	153 mm	2,43 kg/m	2 bar
110 mm 4 1/8"	120 mm	165 mm	2,90 kg/m	2 bar
127 mm 5"	137 mm	191 mm	3,33 kg/m	2 bar
152 mm 6"	163 mm	228 mm	5,04 kg/m	2 bar
203 mm 8"	218 mm	406 mm	8,56 kg/m	2 bar
254 mm 10"	270 mm	508 mm	10,03 kg/m	2 bar
303 mm 12"	323 mm	606 mm	12,88 kg/m	2 bar

### RUBBER EXHAUST HOSE



SLANG

Available with internal diameters of 30 - 40 - 45 - 51 - 57 - 60 - 65 - 76 - 90 - 102 - 110 - 127 - 152 - 203 - 254 or 303 mm.

An engine with a water injection exhaust elbow with an external diameter of 57 mm (2 1/4") may be connected to 60 mm VETUS exhaust hose. In this case VETUS waterlocks, mufflers, gosenecks and transom connections with a size of ø 60 mm can be used as well.

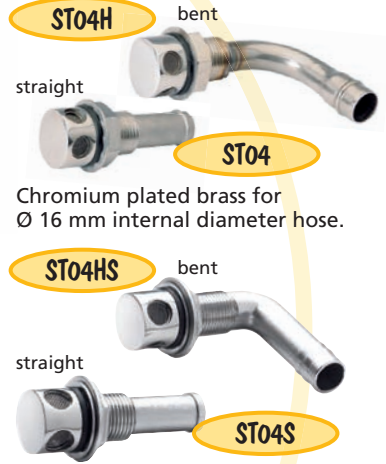
**STAINLESS STEEL BREATHER NIPPLES (AISI 316)**



**AB16S** For hose Ø 16 mm straight  
**AB16B** For hose Ø 16 mm angled  
**AB19S** For hose Ø 19 mm straight  
**AB19B** For hose Ø 19 mm angled  
**AB19SL** For hose Ø 19 mm straight  
**AB25B** For hose Ø 25 mm angled  
**AB38B** For hose Ø 38 mm angled

The breathing capacity fulfils the CE requirements. Provided with an easily cleaned stainless steel gauze, which functions as a flame arrester.

**AIR VENT NIPPLES FOR TANKS**



**ST04H** bent  
**ST04** straight  
**ST04HS** bent  
**ST04S** straight

Chromium plated brass for Ø 16 mm internal diameter hose.

Stainless steel (AISI 316) tank breather nipples. Hose connection Ø 16 mm, straight or 90° angled.

**STAINLESS STEEL SKIN FITTINGS (AISI 316)**



**THRU**  
 Available sizes: G 1/2 to G 2 inclusive.

**STAINLESS STEEL HOSE PILLARS (AISI 316)**



**HP**  
 Available sizes G 1/2 x 13 mm, G 3/4 x 19 mm, G 1 x 25 mm, G 1 1/4 x 32 mm, G 1 1/2 x 38 mm and G 2 x 51 mm.

**STAINLESS STEEL WATER SCOOPS (AISI 316)**



**WCAP..S**  
 Available sizes: G 1/2 to G 2 inclusive.

**STAINLESS STEEL BALL VALVES (AISI 316)**



**BV**  
 Available sizes: G 1/2 to G 2 inclusive.

**NICKEL PLATED BRASS FULL BORE BALL VALVES**



**KRAAN**  
 G 1/4, G 3/8, G 1/2, G 3/4, G 1, G 1 1/4, G 1 1/2, G 2, G 2 1/2 and G 3. Suitable for water and diesel fuel.

**NICKEL PLATED BRASS 3-WAY FULL BORE BALL VALVES**



**KRA**  
 Ball valve G 1/2 L, G 3/4 L, G 1 L, G 1 1/4 L and G 1 1/2 L. Suitable for water and diesel fuel.

**BRASS SKIN FITTINGS**



**DOORB**  
 G 3/8, G 1/2, G 3/4, G 1, G 1 1/4, G 1 1/2, G 2, G 2 1/2 and G 3.

**BRASS HOSE PILLARS**



**SLP**  
 G 1/4 x 8 mm, G 1/4 x 16 mm, G 3/8 x 10 mm, G 3/8 x 15 mm, G 1/2 x 13 mm, G 1/2 x 16 mm, G 1/2 x 19 mm, G 3/4 x 16 mm, G 3/4 x 19 mm, G 3/4 x 25 mm, G 1 x 25 mm, G 1 x 32 mm, G 1 1/4 x 32 mm, G 1 1/4 x 38 mm, G 1 1/2 x 32 mm, G 1 1/2 x 38 mm, G 1 1/2 x 45 mm, G 2 x 51 mm, G 2 1/2 x 60 mm, G 3 x 76 mm.

**BRASS 90 DEGR. HOSE PILLARS**



**HPM**  
 G 1/2 x 13 mm, G 3/4 x 19 mm, G 1 x 25 mm, G 1 1/4 x 32 mm and G 1 1/2 x 38 mm.

**BRASS WATER SCOOPS**



**WCAP**  
 G 1/2, G 3/4, G 1, G 1 1/4, G 1 1/2, G 2, G 2 1/2 and G 3.

**BRONZE HOSE PILLARS**



**HPB**  
 G 1/2 x 13 mm, G 3/4 x 19 mm, G 1 x 25 mm, G 1 1/4 x 32 mm and G 1 1/2 x 38 mm.

**BRONZE SKIN FITTINGS**



**THRUB**  
 G 1/2, G 3/4, G 1, G 1 1/4, and G 1 1/2.

**BRONZE WATER SCOOPS**



**WCAPB**  
 G 1/2, G 3/4, G 1, G 1 1/4, and G 1 1/2.

**BRONZE BALL VALVES**



**BVB**  
 G 1/2, G 3/4, G 1, G 1 1/4, and G 1 1/2.

**"HEAVY DUTY" HOSE CLAMPS**

Material: galvanised steel AISI 430, bright passivated. Suitable for hoses between Ø 34 and Ø 329 mm.



**STAINLESS STEEL HOSE CLAMPS HEAVY DUTY**

Suitable for hoses between Ø 34 and Ø 329 mm.



**STAINLESS STEEL HOSE CLAMPS**

Suitable for hoses between Ø 8 and Ø 170 mm.



**STAINLESS STEEL DECK ENTRIES (AISI 316) WITH WATERTIGHT COVER**



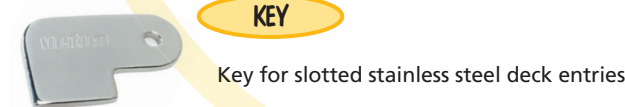
**WATER**  
 Ø 38 mm.  
 Cover Ø 87 mm

**UNLEADED PETROL**  
 Ø 38 mm.  
 Cover Ø 87 mm.

**DIESEL FUEL**  
 Ø 38 mm.  
 Cover Ø 87 mm.

**DIESEL FUEL**  
 Ø 51 mm.  
 Cover Ø 93 mm.

**WASTE WATER**  
 Ø 38 mm.  
 Cover Ø 87 mm.  
 Satisfies the ISO 8099 directives  
 G 1½ female thread



These stainless steel deck entries (AISI 316) are also available with a winch handle socket.

**DECK PLATES**

Chromium plated brass

Water hose Ø 38 mm **FCAPWATER**

Fuel hose Ø 38 mm **FCAPDF38**

Fuel hose Ø 50 mm **FCAPDF50**

Waste water hose Ø 38 mm **CAPWC38**



**DELTRIN (WHITE) SKIN FITTINGS**



**DOORN**

G 5/8 x 16 mm, G 3/4 x 19 mm, G 1 x 25 mm, G 1¼ x 32 mm, G 1½ x 38 mm

**REMOTELY CONTROLLED BALL VALVES**



**EBV**

There is no need to compromise the safety of your boat. By fitting these VETUS ball valves with remote control, all seacocks may now be closed or opened electrically from a single central position.

The electric control units G ½ to G 2 can be easily unbolted from the relevant ball valve. This also facilitates the installation of the ball valve and allows the valve to be opened or closed by hand in an emergency. The valves can be powered fully open or fully closed in approximately 12-15 seconds and the rated power consumption is approximately 4-15 Watts. As standard, each electrically operated valve is supplied with a ball valve, a 12 or 24 Volt remote control unit and a switch panel. These ball valves are resistant against the influences of petrol and diesel fuels. Please consult the locally applicable directives for fitting into petrol or diesel fuel lines. The electric motor is ignition protected and complies with the directive of ISO 8846. The G-threading meets the requirements of ISO 228-1 and ISO 9093-1.

Available for 12 or 24 Volt DC supply, with nickel plated brass ball valves G ½, G ¾, G 1, G 1½ or G 2. The housing of the electric control is **watertight** according to IP 65. Dimensions (without the ball valve): 110 x 74 x 80 mm (l x w x h).

The switch panel, shown here, is supplied as standard. The monitoring lights indicate the position of the ball valve (open or closed). The dimensions of the panel are: 78 x 47 x 19 mm.

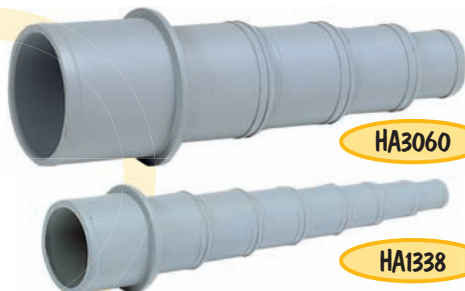


**IMPORTANT NOTE**

Sea cocks on board boats are often "out of service" for long periods of time. e.g. when the boat is in winter storage, with the risk that they will get stuck. It is therefore important to know that VETUS remotely controlled ball valves have sufficient torque to free even stuck valves. Of course these ball valves can always be operated manually, if so required.

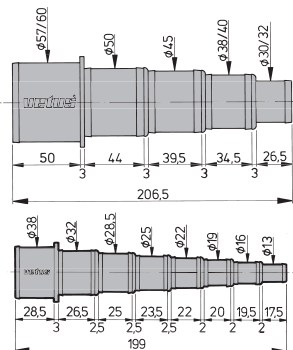
**HOSE PILLARS (MADE OF SYNTHETIC MATERIAL) TO BE CUT TO SIZE**

The larger one is ideal for interconnection of exhaust hoses, see page 89.



**HA3060**

**HA1338**



**PLASTIC HOSE CONNECTIONS**

Hose connectors, made of synthetic material. Available as straight connectors or 60° bend, for exhaust hose with internal diameters from 40 mm to 150 mm inclusive. Available with 90° bend for exhaust hose with internal diameters 127, 152, 203 or 254 mm.

**SLVBR**



**SLVBG**



When developing products for pleasure craft, the extreme conditions to which these are often exposed are always taken into consideration. During the summer, the boat and all its components are used intensively, exposed to heat, salt and humidity, whereas in the winter nothing moves at all. It is therefore imperative to use the highest quality lubricants and coolants for all moving parts, such as the engine, gearbox, hydraulic steering system, power hydraulics, etc., in order to prevent wear and tear and corrosion.



**VETUS TRANSMISSION OIL**

Vetus Transmission Oil is suitable for all types of marine transmissions which specify Automatic Transmission Fluid (ATF) Dextron IID or ATF Suffix A. This oil contains additives which protect the internal metal parts of the transmission against corrosion and wear, even at high operational temperatures. It is also suitable for hydraulic systems, for which this oil quality is specified. May not be used in applications where API GL4 or GL5 are specified.

**Vetus Transmission Oil exceeds the requirements of: Dexron IID ZF TE-ML-03D/04D/11A/14A/17C GM Dexron IID**

Can: 1 litre contents  
Colour: red

**VETUS SPECIAL GEARBOX OIL**

Vetus Special Gearbox Oil is recommended for use in bow thruster drive legs, anchor windlass gearboxes and outboard motor drive legs if compliant with the manufacturer's specifications. This oil contains additives which offer full protection against wear and tear, as well as metal to metal contact which may occur under extreme loadings. It has excellent anti-corrosion properties and resistance to ageing. May be mixed with other API GL4 and GL5 oil types.

**Vetus Special Gearbox Oil exceeds the requirements of: API GL-5, SAE 80W-90**

**ZF TE-ML-05A/07A/16B/17B/19B MIL-L-2105 D**

Can: 0.5 litre contents  
Colour: beige

**VETUS MARINE DIESEL ENGINE OIL 15W-40**

Vetus Marine Diesel Engine Oil 15W-40 is suitable for all modern marine diesel engines and generator sets. It also meets the very high requirements of turbo-charged engines and engines with modern valve technology. This mineral oil provides low oil consumption, excellent rust and internal corrosion protection and detergents to maintain engine cleanliness. As a result, optimal combustion and low exhaust emission values are ensured.

**Vetus Marine Diesel Engine Oil 15W-40 exceeds the requirements of: API CI-4, ACEA A3/B3, A3/B4, E7, MB 228.3/229.1, MAN M3275, Volvo VDS-3, Cummins CES 20071 / 20072 / 20076 / 20077, CAT ECF-1**

Cans: 1 or 4 litres contents  
Colour: beige

**VETUS MARINE DIESEL SYNTHETIC ENGINE OIL 10W-40**

Vetus Marine Diesel Synthetic Engine Oil 10W-40 represents the highest quality synthetic oil, especially developed for modern high output marine diesel engines and generator sets. This state of the art engine oil is recommended for the new

generation marine diesel engines, ensuring low fuel and oil consumption, optimum protection against wear and tear and corrosion and a long service life. The product is ideal for use in diesel engines with very low exhaust gas emissions, in combination with modern low sulphur fuels.

**Vetus Marine Diesel Synthetic Engine Oil 10W-40 exceeds the requirements of: API CF/SL; ACEA A3/B4, E4, E7; MB 228.5/229.1; MAN M3277CRT; VW 505.00; Volvo VDS-2**

Cans: 1 or 4 litre contents  
Colour: beige

**VETUS HYDRAULIC STEERING OIL HF 15**

Vetus Hydraulic Steering Oil HF15 is a low viscosity oil for hydraulic steering systems with optimum results at all temperatures. This oil has a very low coagulation point and a very high viscosity index. May be mixed with other hydraulic mineral oils.

**Viscosity: 22 cSt at 20° C. Viscosity index: 353 DIN 51524**

Can: 1 litre contents  
Colour: green

**VETUS HYDRAULIC OIL HT**

Vetus Hydraulic Oil HT is a fluid suitable for power hydraulic systems. The product has extremely high EP properties and provides optimum

protection against wear and tear and corrosion together with a long service life. Additives in this oil reduce foam formation and ageing and ensure excellent water separation properties.

**Viscosity: ISO VG 46**

**Vetus Hydraulic Oil HT exceeds the requirements of: DIN 51524, 2 HLP, FZG 12, Vickers Vane Pump**

Cans: 1, 4 or 20 liters contents  
Colour: neutral

**VETUS ORGANIC COOLANT -38**

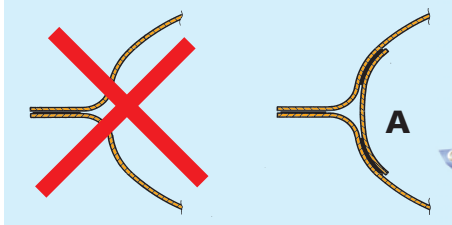
Vetus Organic Coolant -38 is suitable for all types of engine, made of cast iron, steel, or aluminium. It is provided with anti-corrosion additives and must be used undiluted. This coolant can be used all year long and does not affect seals or hoses. It is also ideal for use in heating and air conditioning systems, as well as hydraulically operated remote controls. May be mixed with other modern cooling liquids.

**VETUS Organic Coolant -38 Organic cooling liquid Protection down to -38° C, do not dilute.**

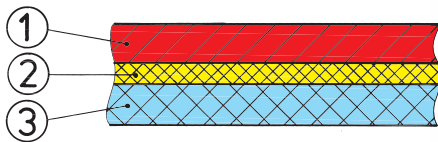
Cans: 1 or 4 litres contents  
Colour: light yellow

*All 0.5 and 1 litre cans are provided with a pull out spout for easy filling and to prevent environment pollution.*

These tanks can be installed easily and quickly; they assume the shape of the space, in which they are placed and they can be positioned in places that are normally difficult to reach. Also, generally speaking, there is no need for any additional installation parts. In fact, fitting the outlet nipple and connecting the hoses for inlet and outlet are the only things to be done.



We not only weld the seams, but in addition we also weld an extra strip (see drawing A). This makes the VETUS flexible tank resistant against much higher pressures, especially if the contents are moving when the boat is rolling or pitching.

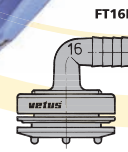
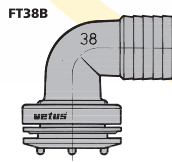


The fabric of VETUS flexible water tanks consists of three layers:  
 1. a wear resistant layer  
 2. a reinforcement layer  
 3. a taste-free layer



**TANKW**

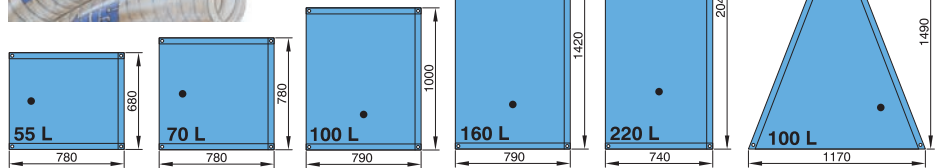
Each VETUS flexible drinking water tank has two right angle nipples as standard supply: one for connection to the filling pipe (Ø 38 mm) and the other one for connection to the pump hose (Ø 16 mm). The filler nipple comes fitted to the top of the tank and the other one is supplied loose for easy fitment in any desired position. Additional nipples can be supplied as an option. See price list.



Capacity (appr.)	Dimensions (appr.)	Height filled (appr.)
55 litres	68 x 78 cm	25 cm
70 litres	78 x 78 cm	27 cm
100 litres	79 x 100 cm	27 cm
100 litres (Δ)	117 x 149 cm	24 cm
160 litres	79 x 142 cm	27 cm
220 litres	74 x 204 cm	27 cm

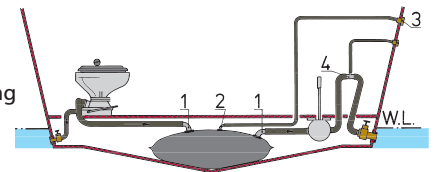


For various hoses see page 88 and 89.

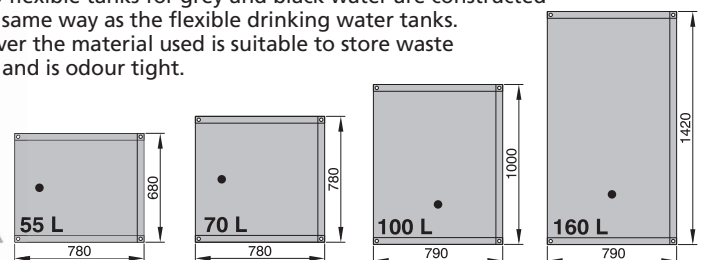


**FLEXIBLE TANKS FOR TOILETS AND WASTE WATER**

- 2 right angle nipples Ø 38 mm. (supplied with each tank)
- right angle breather nipple Ø 16 mm, already fitted.
- breather nipple Ø 16 mm
- breather bend for anti-siphoning device, see page 82. When discharge of the tank through a deck plate is required, a Ø 38 mm tank connector is available as an option, see the price-list.



VETUS flexible tanks for grey and black water are constructed in the same way as the flexible drinking water tanks. However the material used is suitable to store waste water and is odour tight.



**TANKY**

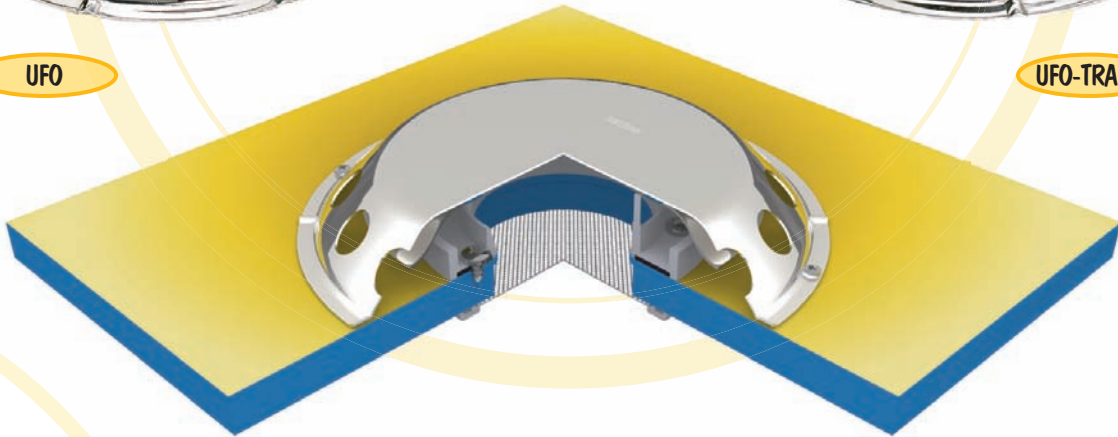
Small cabins aboard boats must be ventilated adequately and be connected to the outside air on a permanent basis, especially when the temperature drops, so as to keep the air humidity inside and outside as equal as possible. This in order to prevent condensation and its devastating effects.



UFO

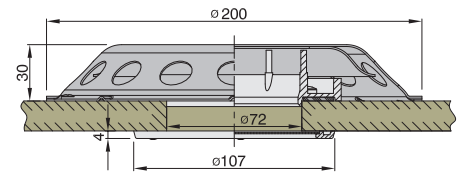


UFO-TRANS



## PERMANENT VENTILATORS TYPE UFO AND UFOTRANS (STAINLESS STEEL, AISI 316)

These models are made of stainless steel and they cannot be closed, so that they will ensure permanent ventilation. The TRANS version is also translucent. These ventilators are rain and splash proof and the outside is high-gloss polished. They may also be used in combination with our electric extraction ventilators (see page 95). They come complete with a mosquito screen and an interior finishing ring as standard. The net free flow area amounts to 31,8 m<sup>2</sup>.

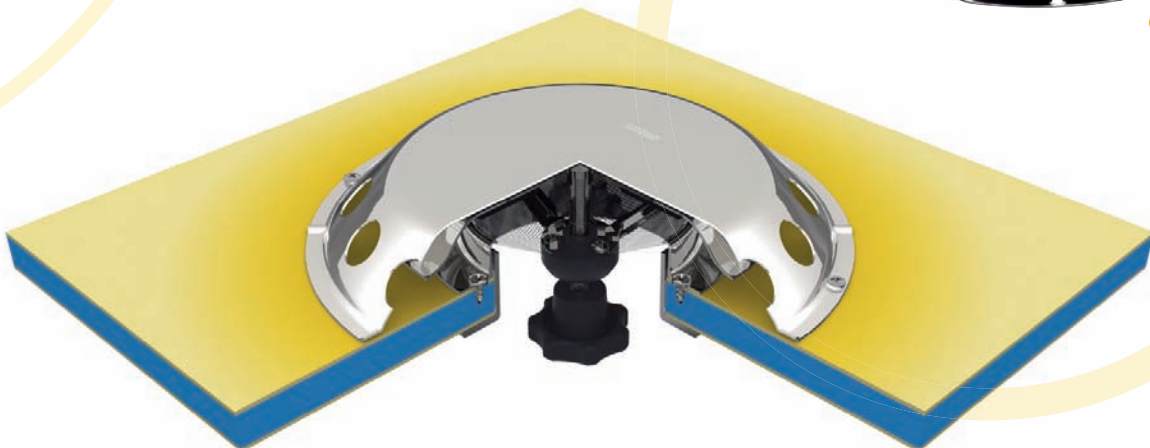


## DECK VENTILATORS WHICH MAY BE CLOSED, TYPE UFO 2 (STAINLESS STEEL, AISI 316)

Model UFO2 is a type of ventilator which can be closed entirely, if so desired. This is of special importance in the case of a sailboat on the open sea, with a view to the risk of water washing over. The ventilation is excellent when opened and the unit is then still rain and splash proof. They come complete with a mosquito screen and a finishing ring for the interior, as standard. The net free flow area amounts to 30 cm<sup>2</sup>.



UFO2

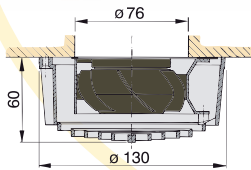


**Type FAN, 12 Volt - 0.19 A / 24 Volt - 0.11 A**  
**(One full week of operation at half speed adds up to current consumption of 16 Ah. only).**

Designed for saloons, cabins and toilets aboard boats. Ideally suited for heat extraction near refrigerator. Hardly audible and suitable for installation to both ceiling and wall. Can also be used together with VETUS deck ventilators Ufo, Ufo-Trans and Scirocco (see page 94 and 97). With the **extremely low energy consumption of 0.19 A at 12 Volt (when running 6 hours continuously for instance, only 1.14 Ah is used)**, this VETUS ventilator is particularly suitable for boats. The special long-life computer motor has a **life-time of not less than 50,000 hours**. Since the motor does not have carbon brushes, the noise level is extremely low. Consequently the ideal ventilator for ventilation of cabins, for instance at night, for in total only approx. 1.3 Ah continuously, keeping the cabin free of mosquitos as well.

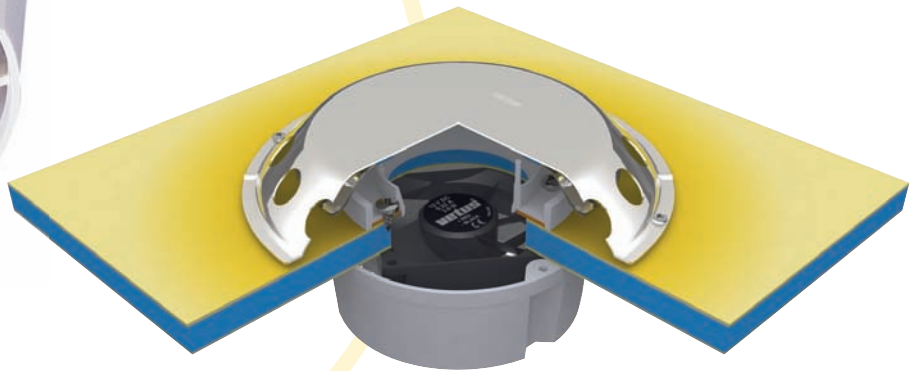


FAN



**Technical details:**

- The motor is a **long-life** computer motor, which can run continuously.
- Available in 12 or 24 Volt.
- Consumption is **only 0.19 A** at 12 Volt and 0.11 A at 24 Volt.
- **Very low noise level** (no carbon brushes).
- Life expectancy is at least 50,000 hours of operation.
- The capacity is 72 m<sup>3</sup>/hour (42 cfm) (every area should be ventilated 3 to 4 times per hour).
- Provided with a switch **for 2 speeds**.
- Static pressure: 6 mm H<sub>2</sub>O.



The VETUS electric ventilator is ideally suited for under deck installation, in combination with the rain and splash proof UFO permanent ventilator. See page 94.

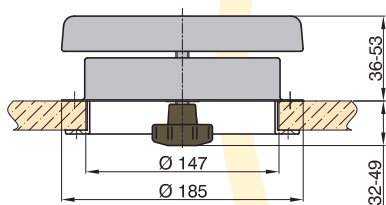
**MUSHROOM VENTILATORS**

Mushroom ventilators, made of stainless steel, type AISI 316, polished high-gloss, including mosquito screen and counter flange, made of synthetic material.

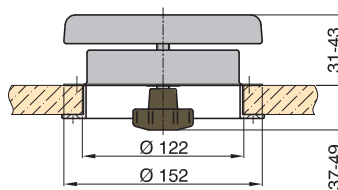
D'ARTAGNANI

ATHOSI

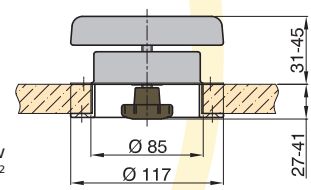
PORTOSI



Free flow area 76 cm<sup>2</sup>



Free flow area 45 cm<sup>2</sup>



Free flow area 30 cm<sup>2</sup>



LEVANTER

COLOUR RED (RAL 3020)



### TYPE LEVANTER AND MISTRAL

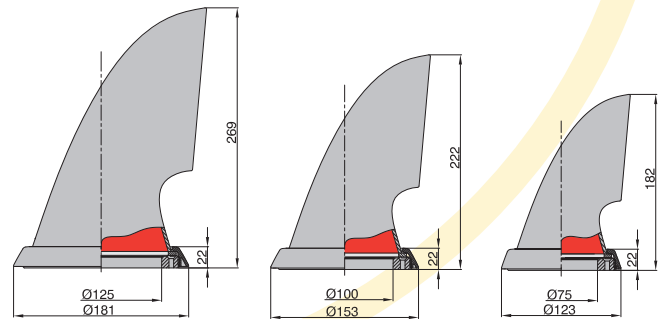
The classical cowl ventilator has been in production for many years, with few changes to its appearance in that time. These two new and sophisticated cowl ventilators from VETUS have deck openings of  $\varnothing$  75, 100 or 125 mm.

They are available in two executions:

- LEVANTER. Cast stainless steel AISI316 cowl with red interior.
- MISTRAL. Cast stainless steel cowl with white interior.

The clamping ring has also been completely redesigned as well. It can be fastened by hand, or with a special tool, which is supplied as standard. If the tool is used for fastening, the risk of theft is almost eliminated.

A storm cover plate is also supplied as standard.



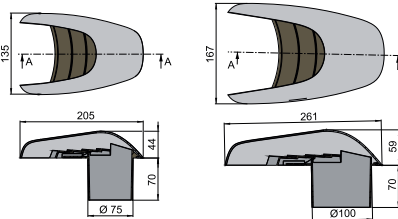
Free flow area:  
76 cm<sup>2</sup>

Free flow area:  
45 cm<sup>2</sup>

Free flow area:  
30 cm<sup>2</sup>

### STAINLESS STEEL SHELL VENTILATORS

TYPHOON



The very well-known shell ventilator is redefined and updated.

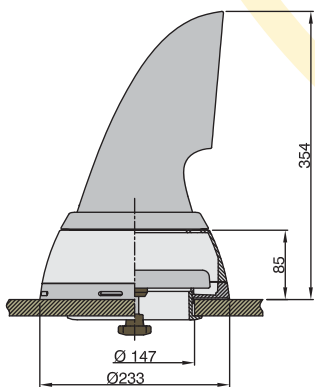
The outer cover is made of high-gloss polished stainless steel (AISI 316) and all other parts are made of synthetic materials. Two sizes are available, with hose connector of  $\varnothing$  75 or  $\varnothing$  100 mm. When installation is completed, no screws are visible. The unit is suitable for horizontal or vertical use.  $\varnothing$  75 mm Free flow area: 30 cm<sup>2</sup>,  $\varnothing$  100 mm Free flow area: 41 cm<sup>2</sup>.

**MISTRAL**

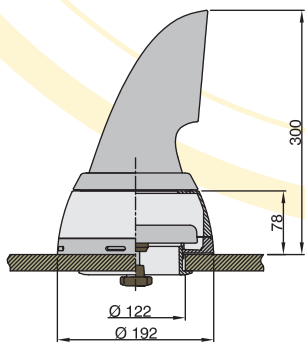
**COLOUR WHITE (RAL 9003)**



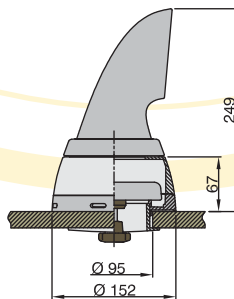
For all VETUS cowl ventilators (except type S), we can supply a plastic dorade box as an option. This drains off any water entering the ventilator and can be closed off entirely by means of the incorporated stainless steel mushroom ventilator. The mushroom ventilator also includes a mosquito screen



Free flow area:  
76 cm<sup>2</sup>



Free flow area:  
45 cm<sup>2</sup>



Free flow area:  
30 cm<sup>2</sup>



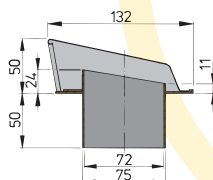
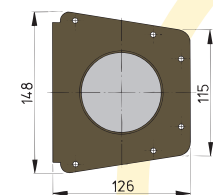
**BOX 75**

**BOX 100**

**BOX 125**

## STAINLESS STEEL SHELL VENTILATORS

The Scirocco can be screwed directly on to hull or superstructure. A plastic base plate, complete with water guard and hose connection (Ø 76 mm) is standard supply. The whole unit can be installed both horizontally or vertically. The ideal solution for ventilation openings to the engine room. Free flow area: 38,5 cm<sup>2</sup>.



**SCIROCCO**

# COWL VENTILATORS STAINLESS STEEL (AISI 316)

**COLOUR RED (RAL 3020)**



**YOG316R**



**TOM316R**



**JER316R**



**DON316R**

Both the cowls and the rings are made of cast stainless steel (by lost wax casting). These cowls are revolving and removable. The clamping ring can be fastened by hand, or with a special tool, which is supplied as standard. If the tool is used for fastening, the risk of theft is almost eliminated. A Monel mosquito screen and a stainless steel cover plate to close off the cowl ventilator, can be supplied as an option. Comes complete with threaded ring nut and male deck ring.

**COLOUR WHITE (RAL 9003)**



**YOG316WR**



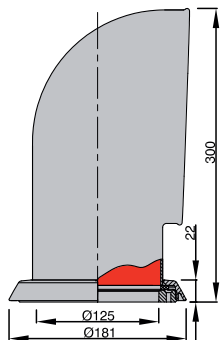
**TOM316WR**



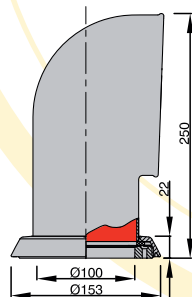
**JER316WR**



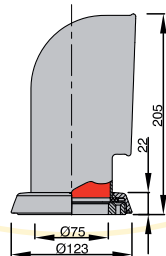
**DON316WR**



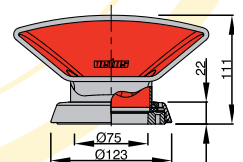
free flow area 122,8 cm<sup>2</sup>



free flow area 78,6 cm<sup>2</sup>



free flow area 44,2 cm<sup>2</sup>



free flow area 44,2 cm<sup>2</sup>

**COWL VENTILATORS** |



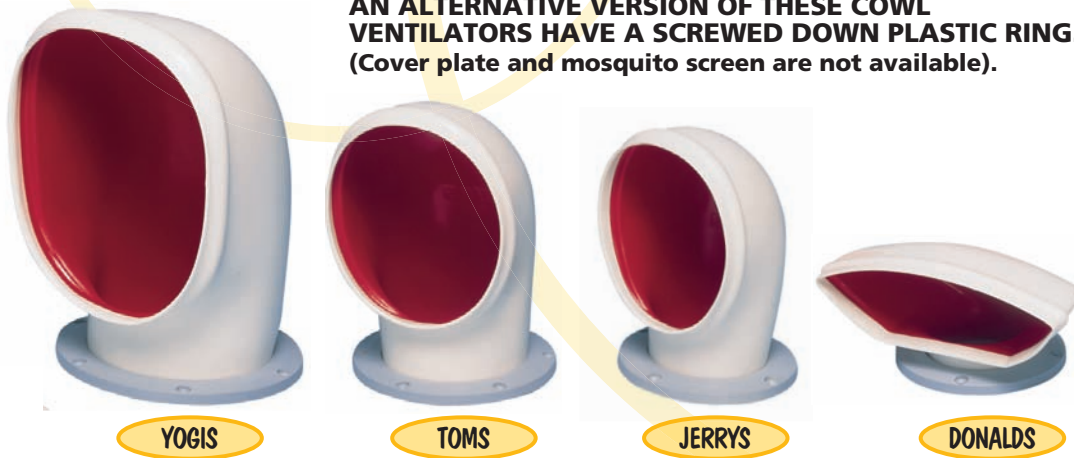
**RING**



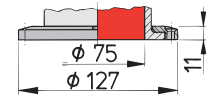
A set consisting of a stainless steel (AISI 316) ring nut and male deck ring is available for each size of cowl ventilator. The key to fasten the ring belongs to the standard scope of supply.

- These cowl ventilators are made of flexible P.V.C. The ring nuts and mating deck flanges are made of hard plastic.
- The cowl ventilators can **revolve** and are **removable**. **No** tools are required, the ring nut can be loosened easily by hand.
- A Monel mosquito screen and a stainless steel cover plate to close off the cowl ventilator, can be supplied as an option.
- For the dimensions, please see adjacent page.

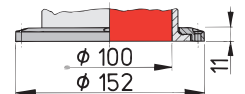
**AN ALTERNATIVE VERSION OF THESE COWL VENTILATORS HAVE A SCREWED DOWN PLASTIC RING. (Cover plate and mosquito screen are not available).**



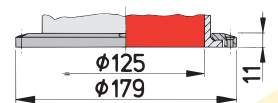
**RING DONALD-S AND JERRY-S**



**RING TOM-S**



**RING YOGI-S**

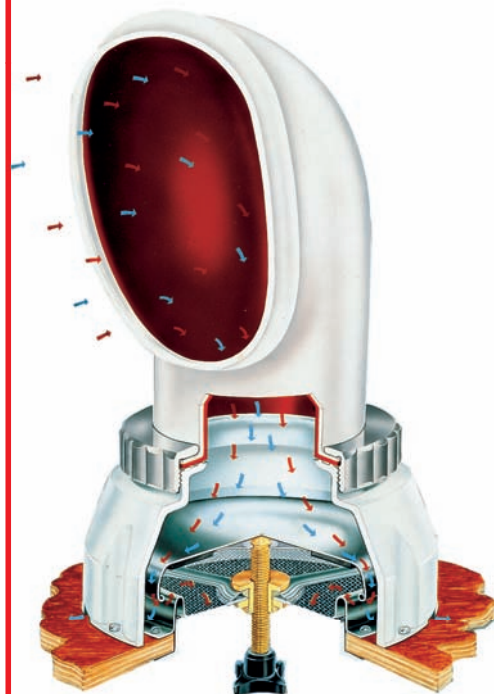


For VETUS cowl ventilators, types YOGI, TOM, JERRY and DONALD, we can supply a plastic dorade box. This drains off any water entering the ventilator and can be closed off entirely by means of the incorporated stainless steel mushroom ventilator.

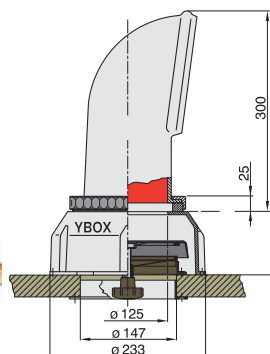
The mushroom ventilator also includes a mosquito screen. The male deck rings, made of either stainless steel or plastic, can be easily fitted to the dorade box using the nuts and bolts supplied.



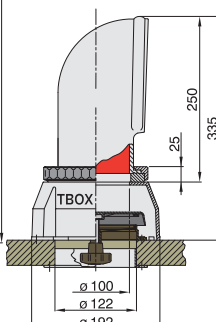
**BOX**



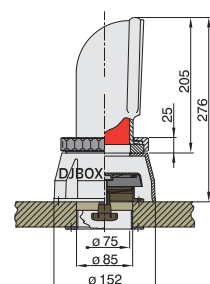
Free flow area 76 cm<sup>2</sup>



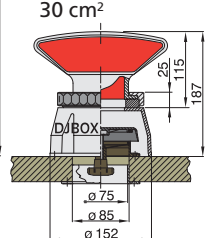
Free flow area 45 cm<sup>2</sup>



Free flow area 30 cm<sup>2</sup>



Free flow area 30 cm<sup>2</sup>



## With standard or with heavy duty aluminium profile

With a wide choice of colours for the glass and the aluminium frames (powder-coated or anodized).

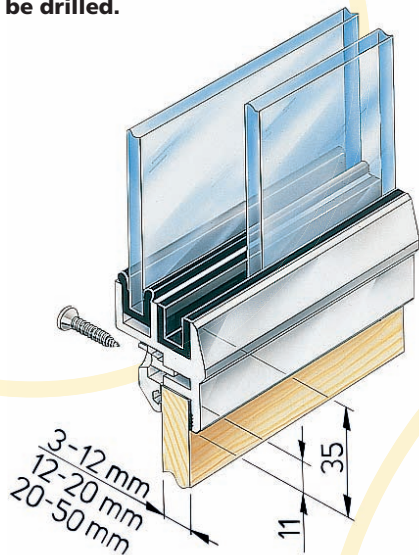
These windows are always **custom made** by us and can be fitted to either metal, wooden or G.R.P. hulls. The frame profiles are made of **hand-polished** and anodised aluminium. The glass is toughened and available 5, 6 or 8 mm thick, with an option of 10 mm in combination with the heavy-duty profile. Upon request also available with tinted glass in the colours: green, grey, bronze and blue. In order to manufacture the windows we need patterns on which the correct aperture size is shown. In addition the upper and outer side of the window plus the **hull thickness** must be indicated. All our windows are supplied with a self adhesive sealing strip. Consequently the normal method of sealing the window with Silicone is now superfluous. These windows can be installed into a hull which is only 3 mm thick. Our sliding windows can be supplied with matching mosquito screens. The fixed and the fully hinged windows with standard profile can also be supplied double-glazed. CE classification: A III.



### NEW DEVELOPMENT VETUS "EASY WINDOW"

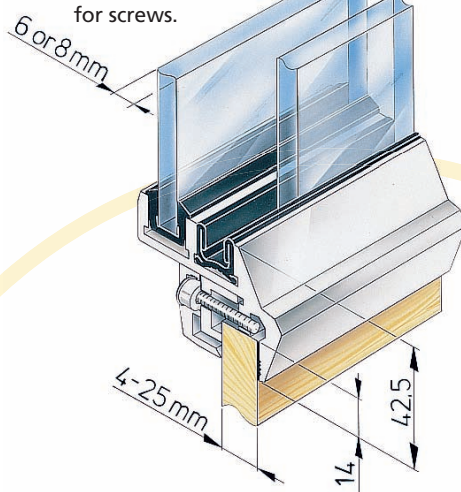
All custom made windows can now be supplied with a non-stick invisible coating that seals the microscopic pores in the glass. This coating repels, rain, sleet, snow and dirt, ensuring optimum visibility and appearance under all conditions.

VETUS boat windows are not fixed by screws, but **clamped**. So **no more holes need to be drilled**.

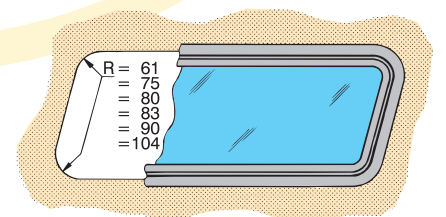


Standard profiles are suitable for hull thicknesses from 3 to 11 mm, from 11 to 20 mm or from 20 to 50 mm.

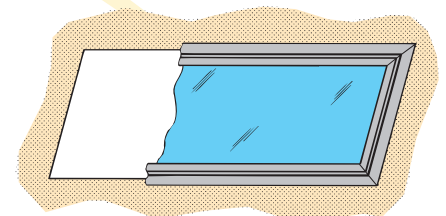
These VETUS boat windows are not screwed into position, but are fixed by clamps. After installation the counter flanges are simply clamped into position, without the need for screws.



Heavy duty profiles are suitable for hull thicknesses from 4 mm to 25 mm.



Standard profile windows are available with corner radii (R) of 61, 75, 83, 90 or 104 mm. Heavy duty profile windows have corner radii of 80 mm.



All windows can be made with mitred corners. These must be fitted to completely flat surfaces.

Fully hinged



Half drop



Fixed



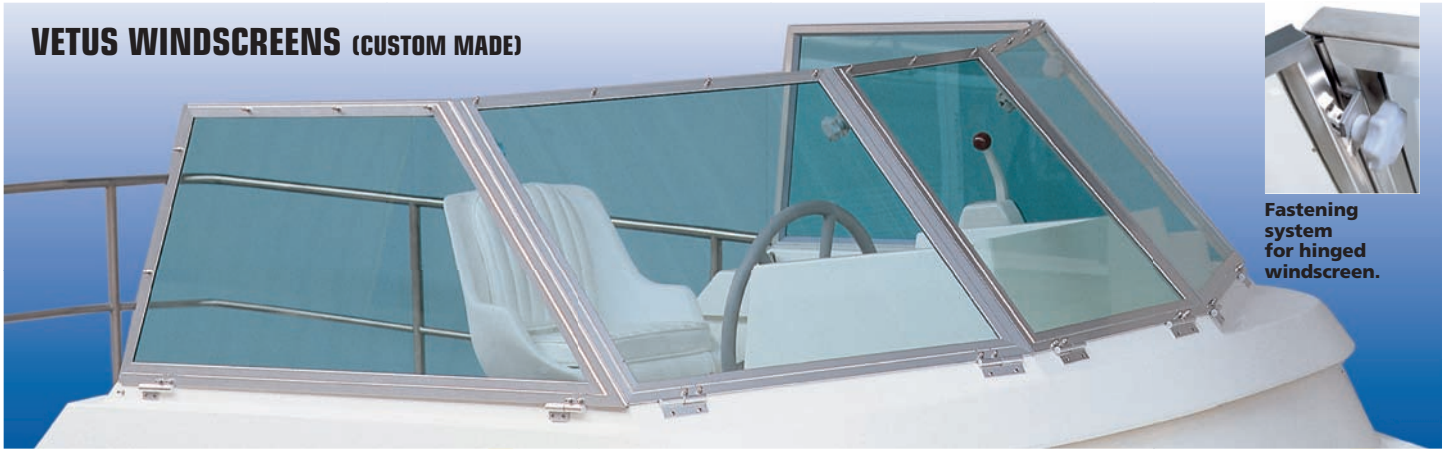
Half hinged



Sliding

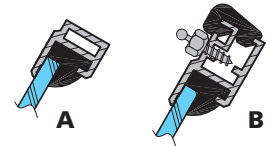
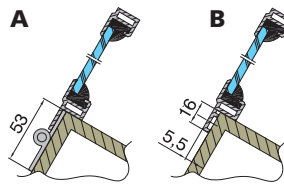
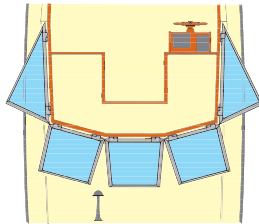


**VETUS WINDSCREENS (CUSTOM MADE)**



VETUS windscreens are **custom made**. They are constructed from polished and anodized or **powder-coated** aluminium extrusions and toughened glass which can be supplied to your choice in the colours clear, green, grey, bronze or blue.

For boats which have to pass under low bridges, we can make the windscreens hinged so that each section can be lowered to the deck. The upper edges of the side screens can also be made with a large radius curve.



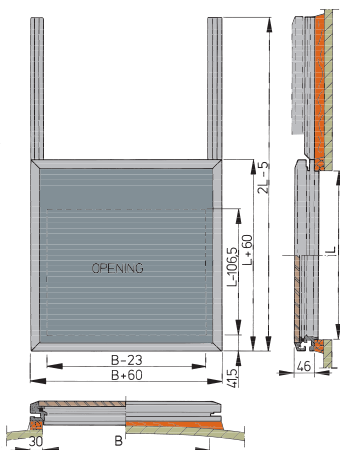
There are 2 installation possibilities: either hinged (A) or fixed (B), see drawing. This is the ideal mounting surface for a VETUS windscreen.

The standard profile along the top edge of the windscreen is as shown in drawing A. If a spray hood is to be fitted, we can install the profile shown in drawing B, to which standard canvas fixings can be attached.

**SLIDING HATCHES (CUSTOM MADE)**



These sliding hatches are **custom made** to your dimensions.



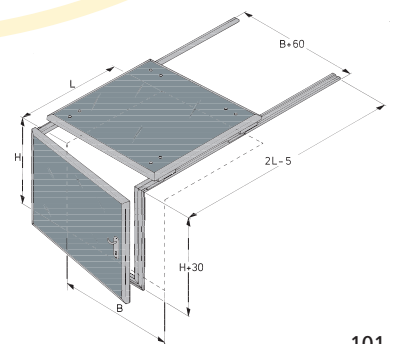
The profiles of the sliding hatches and cabin entries are all made of hand-polished and anodized aluminium. The acrylic panes are 12 mm thick and the colours are "sherry" or "smoke".

**CABIN ENTRIES (CUSTOM MADE)**



Both the hinged door and the top cover (hinged or sliding) are made to your dimensions. CE classified: A IV.

**Cabin entries** may also be supplied without a door, also in this case sliding or hinged.



**CABIN ENTRY WITH SLIDING HATCH AND HINGED DOOR**

# ESCAPE, DECK AND VENTILATION HATCHES TYPE LIBERO

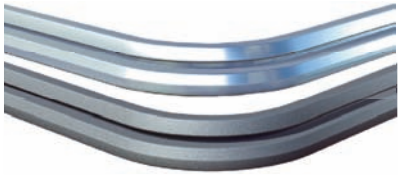
Libero hatches with hand-polished and anodized aluminium frames, 32 or 55 mm corner radius and with 12 mm "smoke" coloured acrylic lid.

## CE classified A II

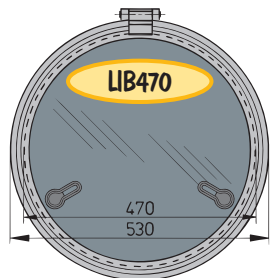
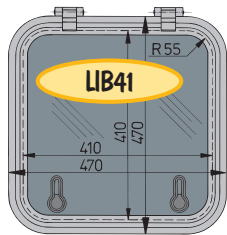
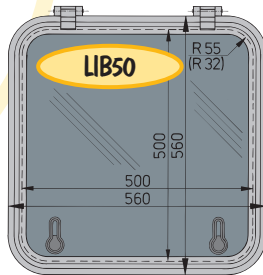
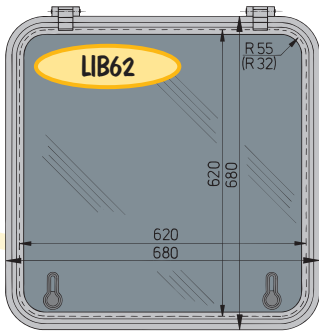
Contrary to most other manufacturers, VETUS has the aluminium profiles polished by hand, prior to the anodization process. Not only that this looks much nicer, but it has another advantage: dirt, salt and grease cannot accumulate into the pores of the aluminium, which would cause permanent stains.

Even after many years of heavy duty in the Mediterranean, VETUS windows, portholes, deck and ventilation hatches will still look like new!

Look at the difference between a hand-polished and anodised profile, compared with one that is anodised only. The hand-polished finish looks much higher quality and due to the silky smooth surface, the aluminium stays shiny and clean.

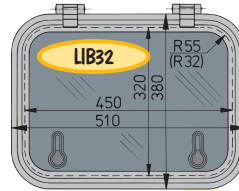
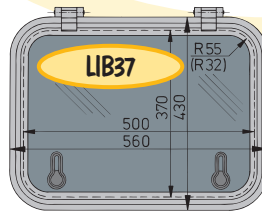


### LIBERO ESCAPE HATCHES

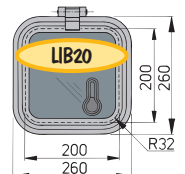
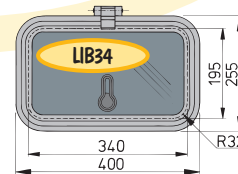


The dimensions given at the dashed lines are the cut-out sizes.

### LIBERO DECK HATCHES



### LIBERO VENTILATION HATCHES

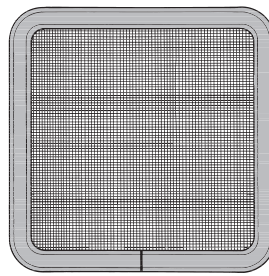


By means of a friction hinge these hatches can remain open in any position, without the need for adjustable supports.

Each of the VETUS Libero deck, escape and ventilation hatches have available, as an option, an anodized aluminium counter flange and a mosquito screen.



COUNTER FLANGE



MOSQUITO SCREEN



Libero escape hatch models LIB62 and LIB50 can also be supplied with a UFO2 deck ventilator. When the hatch is closed, air can circulate into the boat through the rain and splash proof ventilator. In heavy seas though, the UFO ventilator can be shut down totally watertight.

## ESCAPE AND DECK HATCHES TYPE GENIUS |

GENIUS deck hatches have an anodized aluminium frame, a corner radius of 42 mm and the acrylic lid has a thickness of 10 mm, in the colours "smoke" or "green (glass look)".

**CE classified A II**

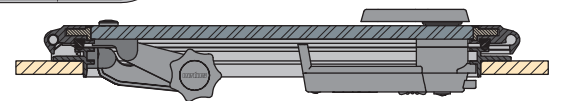
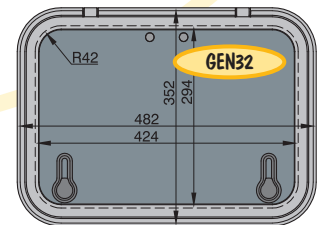
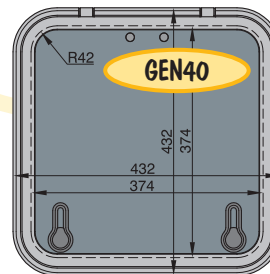
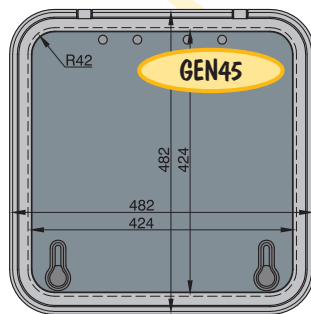
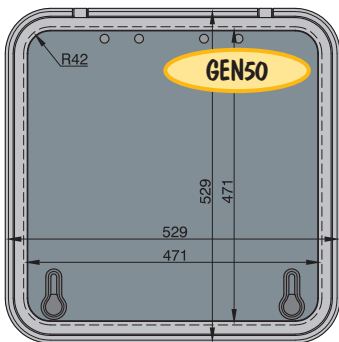


**INFINITELY VARIABLE FRICTION SUPPORT**

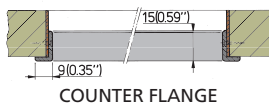
Genius **deck hatches** are equipped with **one central friction support**, enabling the hatch to be opened up to an angle of 180°. This renders the opening of the hatch virtually free of obstacles, so that e.g. sails can be stored in a simple and efficient manner. Genius **escape hatches** have **two** friction supports. **The overall height of a Genius hatch measures only 26 mm.**

### GENIUS ESCAPE HATCHES

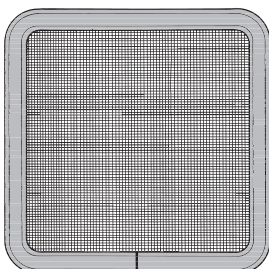
### GENIUS DECK HATCHES



For each of the Genius hatches an anodized aluminium **counter flange** and a **mosquito screen** are available as an option.



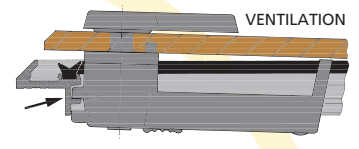
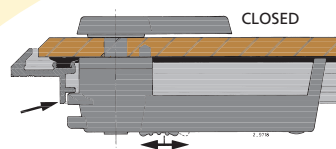
COUNTER FLANGE



MOSQUITO SCREENS

The dimensions given at the dashed lines are the cut-out sizes.

### HANDLES



VETUS hatch handles have a number of advantages.

- The hatch can be opened from either inside or outside.
- The hatch can be shut completely watertight, or secured with a small air gap to allow permanent ventilation.
- An internal locking mechanism ensures the hatch cannot be opened from out-

side when the boat is left unattended. This operates in both the closed or ventilation positions.

- The low external profile ensures that ropes, e.g. running rigging on sailing boats, cannot foul on the handles.
- These handles are available separately and can be used to upgrade older VETUS Libero and Planus hatches.



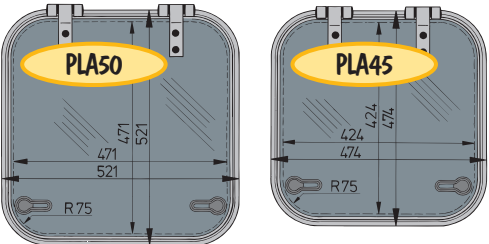
# ESCAPE, DECK AND VENTILATION HATCHES TYPE PLANUS

Planus hatches with anodized aluminium frames, 75 mm corner radius and "smoke" coloured acrylic lid of 10 mm thickness.

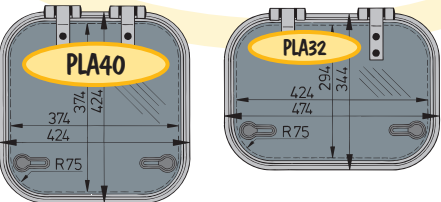
**CE classified A II**



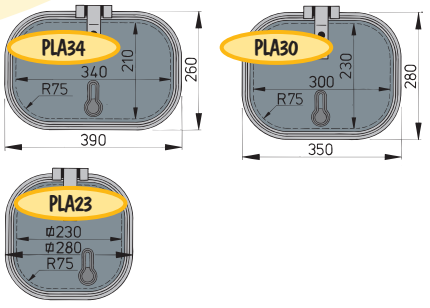
### PLANUS ESCAPE HATCHES



### PLANUS DECK HATCHES



### PLANUS VENTILATION HATCHES

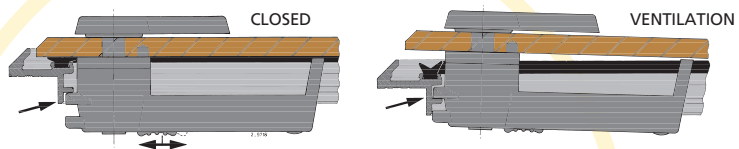


The dimensions given at the dashed lines are the cut-out sizes.

Each of the VETUS Planus deck, escape and ventilation hatches have available, as an option, an anodized aluminium counter flange and a mosquito screen.

**COUNTER FLANGE** dimensions: 15 (0.59") height, 9 (0.35") width.  
**MOSQUITO SCREEN**

### HANDLES



- VETUS hatch handles have a number of advantages.
- The hatch can be opened from either inside or outside.
  - The hatch can be shut completely watertight, or secured with a small air gap to allow permanent ventilation.
  - An internal locking mechanism ensures the hatch cannot be opened from outside when the boat is left unattended. This operates in both the closed or ventilation positions.
  - The low external profile ensures that ropes, e.g. running rigging on sailing boats, cannot foul on the handles.
  - These handles are available separately and can be used to upgrade older VETUS Libero and Planus hatches.

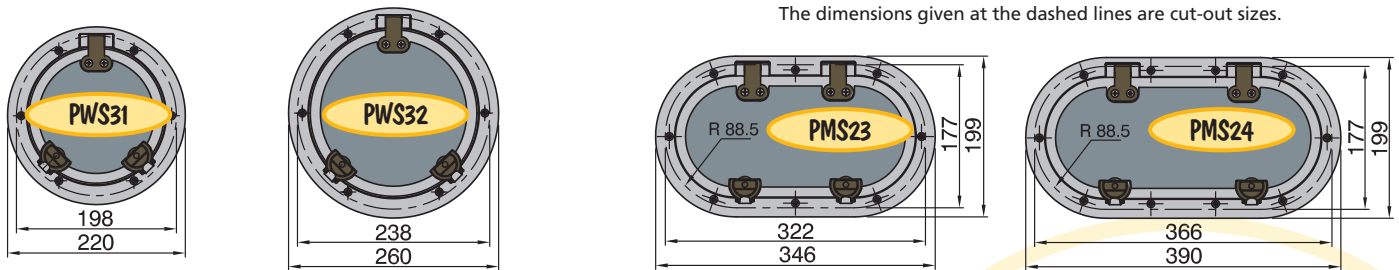
**PORTHOLES MADE OF HIGH GLOSS POLISHED STAINLESS STEEL AISI 316 |**

**THESE PORTHOLES ARE MADE OF CAST AND POLISHED AISI 316 STAINLESS STEEL, ACCORDING TO THE LOST WAX METHOD**

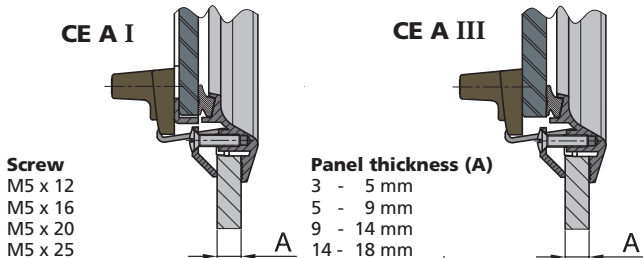


These portholes are available in two different executions:  
 - With a stainless steel inner frame and "smoke" coloured 8 mm acrylic. **CE classified A I**  
 - With unframed 10 mm acrylic, colour "smoke". **CE classified A II**

These portholes are suitable for a panel thickness from 3 to 18 mm.  
 For the recommended screw sizes, please see the table below.



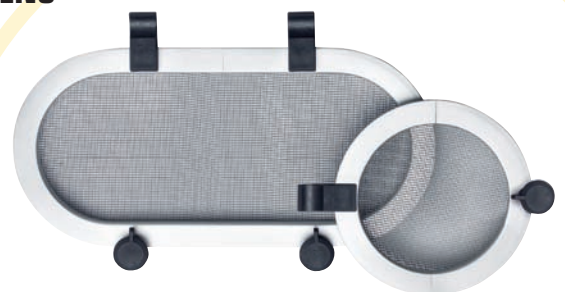
**RECOMMENDED SCREW SIZES:**



Screws available in packs of 50 pcs.

**MOSQUITO SCREENS**

All portholes type PWS and PMS are supplied as standard with an aluminium mosquito screen.

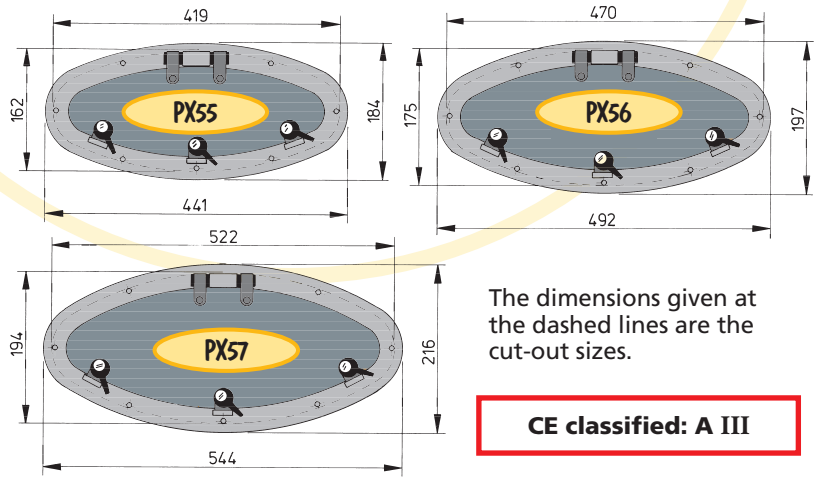
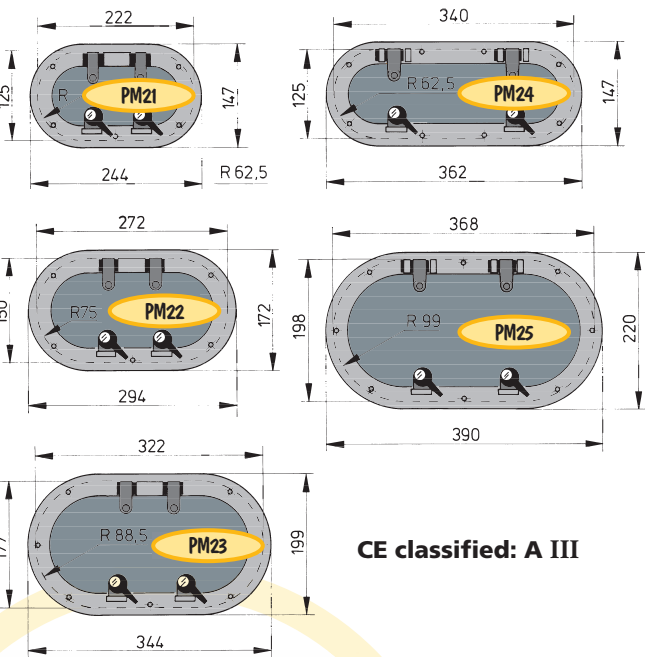


The portholes type PM and PX are supplied with hand-polished and anodized aluminium frames and "smoke" coloured acrylic of 10 mm thickness.

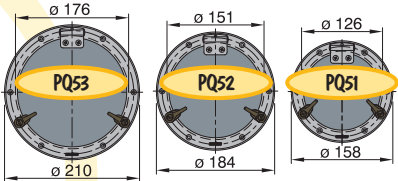


These VETUS portholes are not screwed, but clamped. Consequently, there is no need to drill holes.

The dimensions given at the dashed lines are the cut-out sizes.



**MOSQUITO SCREENS**  
For porthole types PM, PW, PX and PZ, an aluminum framed mosquito screen is available as an option.



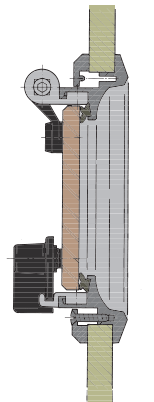
VETUS PQ portholes are made of stainless steel, have an Acrylic window pane ("smoke") of 8 mm thickness, and are provided with a stainless steel counter flange. The dimensions given at the dashed lines are the cut-out sizes. CE classified A II.

**MOSQUITO SCREENS**  
Made of ABS and available for all sizes of PQ portholes. Easy "click-in" construction.

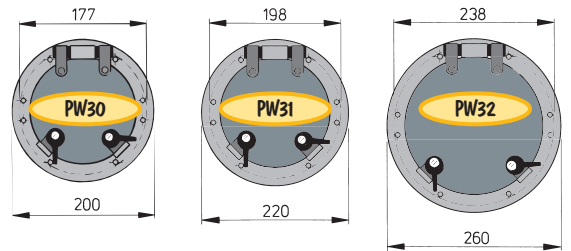
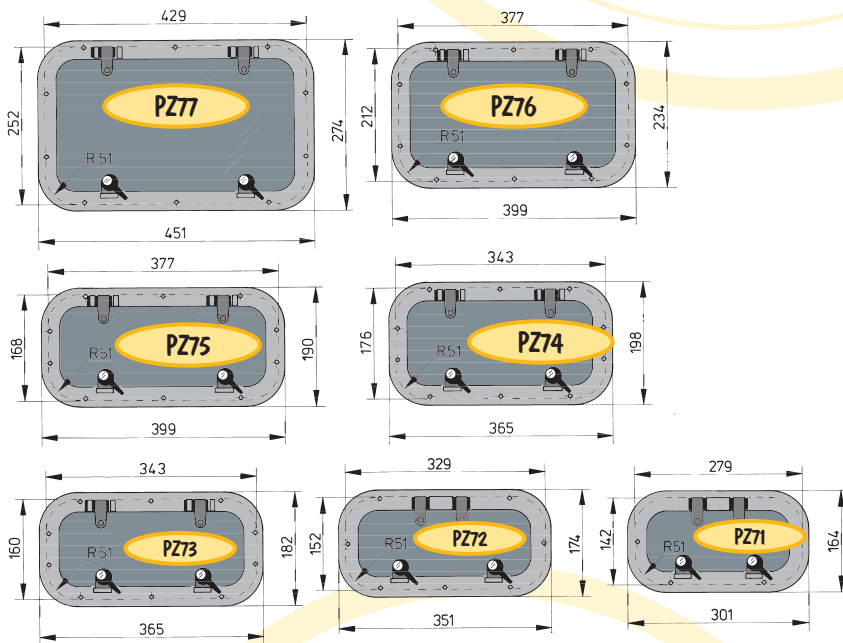
**SCREW-IN COVER (STAINLESS STEEL) WITH THREAD M4**

Ideally suited for VETUS portholes, escape hatches etc. Available in packs of 50 pieces.

The portholes type PZ and PW are supplied with hand polished and anodized aluminium frames and "smoke" coloured acrylic of 10 mm thickness.



MIN. 3 (0.12")  
 MAX. 22.5 (0.87")



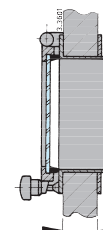
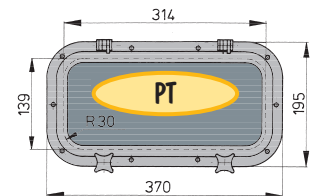
**CE classified: A III**

The dimensions given at the dashed lines are the cut-out sizes. **CE classified A II.**

**PORTLIGHTS, MADE OF GLASSFIBRE REINFORCED NYLON**



- Made of glassfibre reinforced Nylon.
  - Weight: 0.95 kg
  - Acrylic pane, colour "Smoke".
  - Complete with mosquito screen
- CE classified A III**



The dimensions given at the dashed lines are the cut-out sizes.

MAX. 45

### Marine diesel engines

Most pleasure boat owners long for the moment they can set foot aboard. Work is firmly forgotten and other worries vanish into thin air. Their sense of happiness is complete, when the engine comes to life with a healthy roar.

The owner of a motor or sailing boat with a VETUS engine is in a position to enjoy every moment on the water to the max.



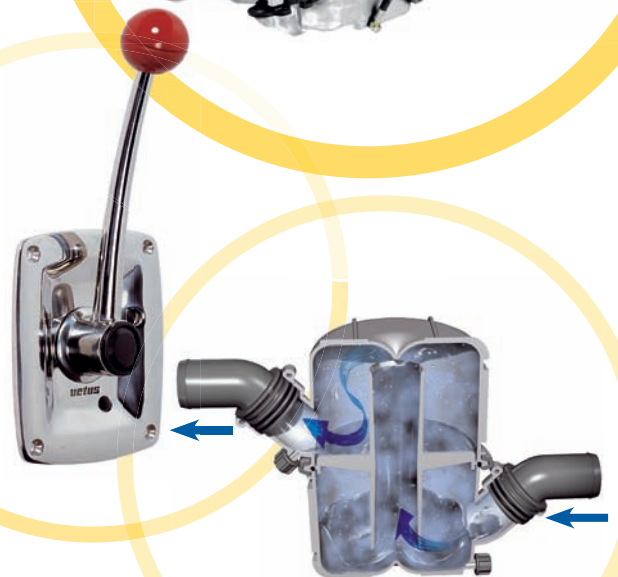
## Engines and the equipment

And that is the way it should be: check the oil and water, turn the key, let go the lines and off you go! Irrespectively of whether you own a sturdy twin cylinder with sail drive or a whispering 6 cylinder beauty, a VETUS marine diesel will be your faithful companion.

To compliment each marine engine in the range, VETUS also offers a well thought out and complete package of "around the engine" products; from the engine remote control to the fuel filter and the propeller shaft to the exhaust system.

All VETUS marine diesel engines are certified in accordance with the emission standards of the Recreational Craft Directive (RCD).

In keeping with well-proven VETUS principles, all components are perfectly matched with one another; a better guarantee for carefree boating is hardly possible. And to back this up, an extensive network of sales and service points all over the world, is there to keep you the happy VETUS customer we want you to be.





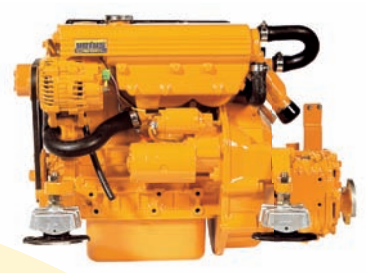
**M 2.C5** 8,1 kW (11 hp)



**M 2.D5** 9,5 kW (13 hp)



**M 2.06** 11,8 kW (16 hp)



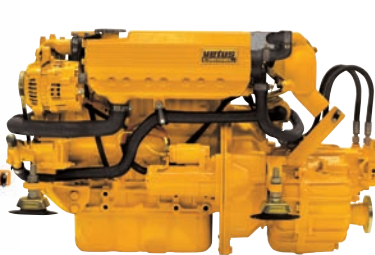
**M 3.28** 20 kW (27,2 hp)



**M 4.15** 24,3 kW (33 hp)



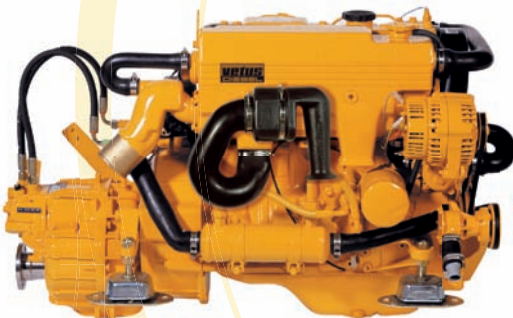
**M 4.17** 30,9 kW (42 hp)



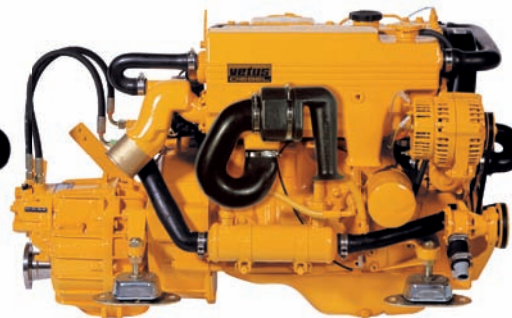
**M 4.55** 38,3 kW (52 hp)



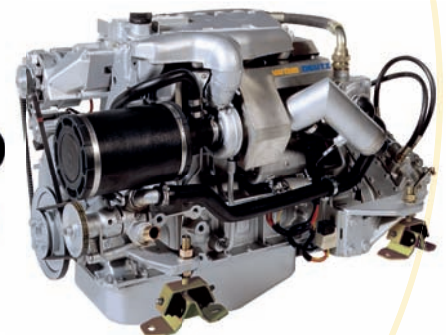
**VF4.140 E** 103 kW (140 hp)  
**VF4.170 E** 125 kW (170 hp)  
**VF5.220 E** 162 kW (220 hp)  
**VF5.250 E** 184 kW (250 hp)



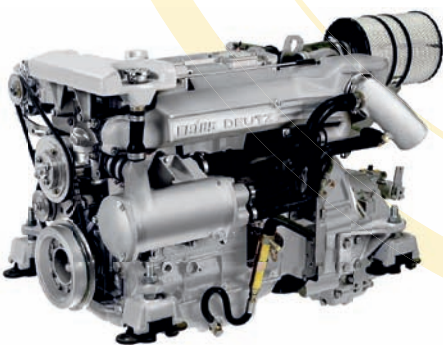
**VH 4.65** 48 kW (65,3 hp)



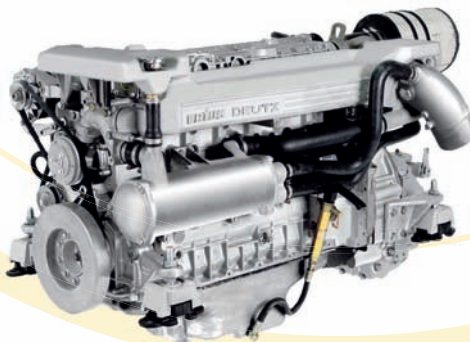
**VH 4.80** 59 kW (80,3 hp)



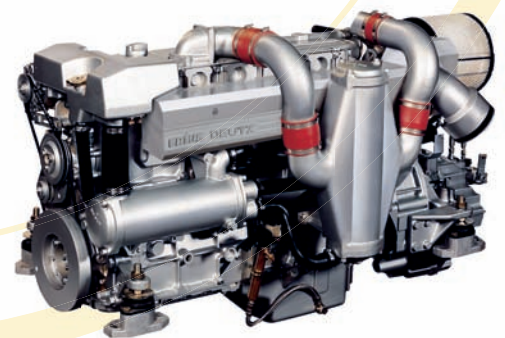
**DT 4.29** 61 kW (83 hp)



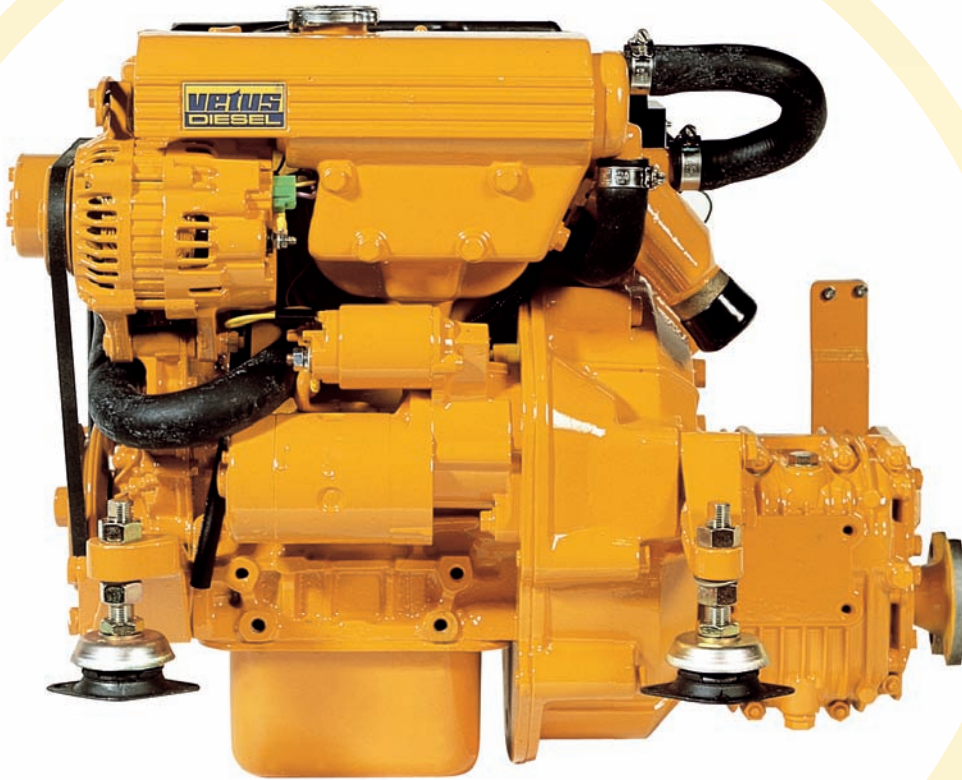
**DT 44** 84 kW (114 hp)  
**DTA 44** 103 kW (140 hp)



**DT 66** 125 kW (170 hp)  
**DTA 66** 155 kW (210 hp)



**DT 67** 170 kW (231 hp)  
**DTA 67** 210 kW (286 hp)

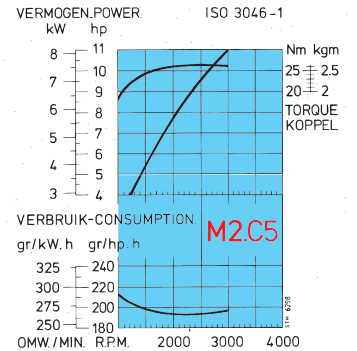
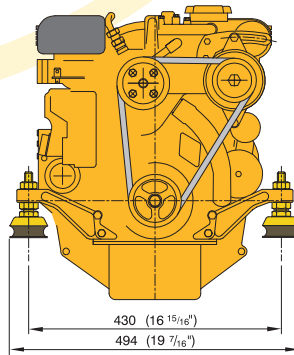
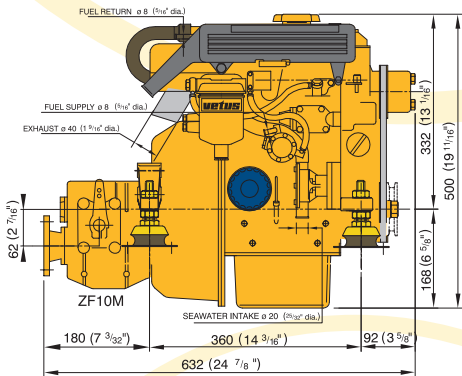


**M 2.C5: 2 CYLINDERS, 8.1 KW (11 HP)**

**Technical data:**

<b>M2.C5</b>	ID/4stroke/2cyl. in line/ NA diesel
Basic engine	: Mitsubishi
Bore	: 70 mm/2.8 inch
Stroke	: 70 mm/2.8 inch
Capacity	: 538 cm <sup>3</sup> /33 cu.inch
Number of cylinders	: 2
Compression ratio	: 23:1
Firing order	: 1-2
Alternator	: 12 Volt - 75 A
* Max. output at flywheel (ISO 3046-1)	: 8.2 kW (11 hp)
* Max. output at propeller shaft (ISO 3046-1)	: 7.9 kW (10,7 hp)
Maximum rpm	: 3000
Torque at 3000 rpm	: 26 Nm
Fuel consumption at 2300 rpm	: 265 g/kW.h (195 g/hp.h)
Gearbox, standard	: TMC40
Ratio	: 2/2,60:1
Optional	: ZF10 2,05/2,72/:1 ZF15MIV 2,13/2,99:1 ZF15MA 1,88/2,63:1
Dry weight (incl. gearbox)	: 98 kg/216 lbs
Suction height of fuel lift pump	: 1.5 m/5 ft
Max.installation angle (backwards)	: 15°
Max.lateral inclination angle (continuously)	: 25°
Max.lateral inclination angle (5 minutes max.)	: 30°
Calorifier connection	: standard
Warning lights and audible alarm for	: oil pressure,temperature (fresh and raw water), charging current
Control light for	: pre-heating
Electric circuit protection	: fuse 10 A
Cooling system	: indirect cooling as standard (keelcooling optional)

\* In accordance with ISO 8665



Certified within 5%

4 VETUS flexible engine mountings, type K25, are supplied with engine model M 2.C5

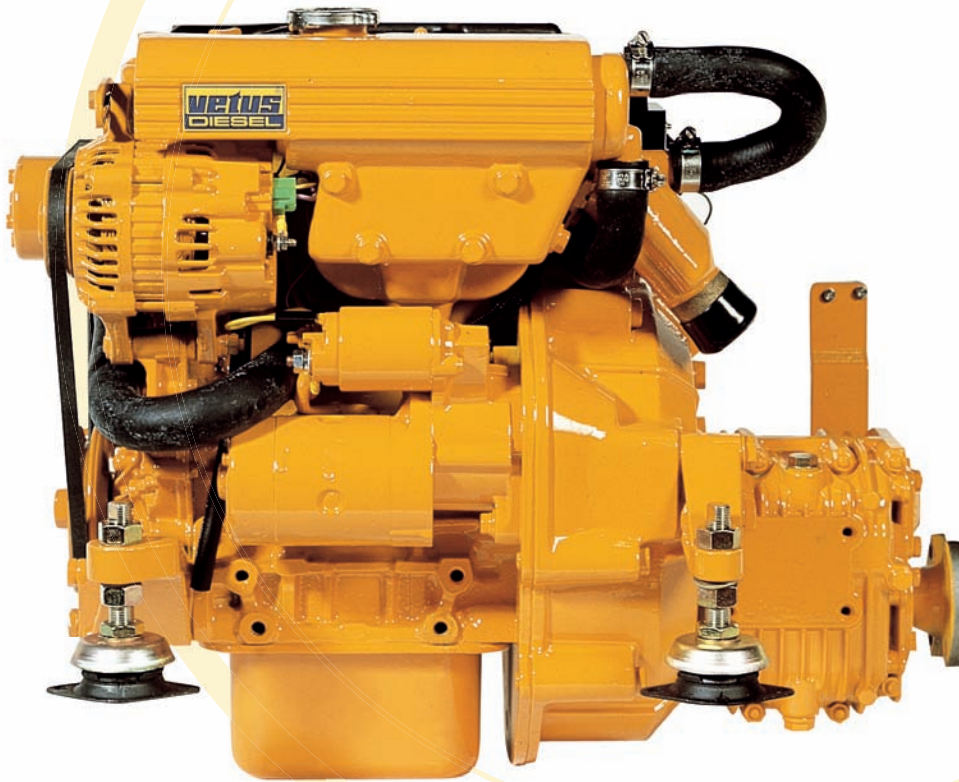


This instrument panel is supplied as standard: Model MP 10 VETUS waterproof engine instrument panel, provided with 5 monitoring lights (LED's) and an acoustic alarm. Instead of the engine panel shown, one of the other VETUS engine panels may be supplied. An engine panel for a second steering position may be supplied as well.



**All "yellow" VETUS engines, shown on these pages, may also be supplied as a version ready to be connected to Volvo Penta Saildrives.**

**S - DRIVE**  
110 S  
120 S  
120 SB



**M 2.D5: 2 CYLINDERS, 9.5 KW (13 HP)**

**Technical data**

**Basic engine**

Bore	: 70 mm/2.8 inch
Stroke	: 70 mm/2.8 inch
Capacity	: 538 cm <sup>3</sup> /33 cu.inch
Number of cylinders	: 2
Compression ratio	: 23:1
Firing order	: 1-2
Alternator	: 12 Volt - 75 A
* Max. output at flywheel (ISO 3046-1)	: 9.5 kW (13 hp)
* Max. output at propeller shaft (ISO 3046-1)	: 9.3 kW (12,6 hp)
Maximum rpm	: 3600
Torque at 3600 rpm	: 25 Nm
Fuel consumption at 2300 rpm	: 265 g/kW.h (195 g/hp.h)
Gearbox, standard	: TMC40
Ratio	: 2,05/2,60:1
Optional	: ZF10 2,05/2,72:1 ZF15MIV 2,13/2,99:1 ZF15MA 1,88/2,63:1

**M 2.D5**

IDI/4stroke/2cyl. in line/

NA diesel

: Mitsubishi

: 70 mm/2.8 inch

: 70 mm/2.8 inch

: 538 cm<sup>3</sup>/33 cu.inch

: 2

: 23:1

: 1-2

: 12 Volt - 75 A

: 9.5 kW (13 hp)

: 9.3 kW (12,6 hp)

: 3600

: 25 Nm

: 265 g/kW.h (195 g/hp.h)

: TMC40

: 2,05/2,60:1

: ZF10 2,05/2,72:1

: ZF15MIV 2,13/2,99:1

: ZF15MA 1,88/2,63:1

: 98 kg/216 lbs

**Dry weight (incl. gearbox)**

**Suction height of fuel lift pump**

: 1.5 m/5 ft

**Max.installation angle (backwards)**

: 15°

**Max.lateral inclination angle (continuously)**

: 25°

**Max.lateral inclination angle (5 minutes max.)**

: 30°

**Calorifier connection**

: standard

**Warning lights and audible alarm for**

: oil pressure,

temperature

(fresh and raw water),

charging current

: pre-heating

: indirect cooling as standard

(keelcooling optional)

**Control light for**

**Electric circuit protection**

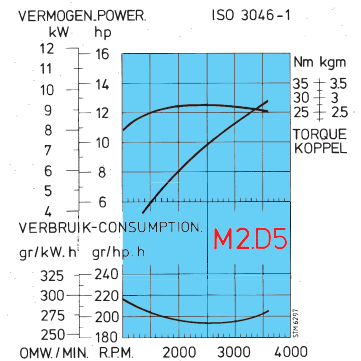
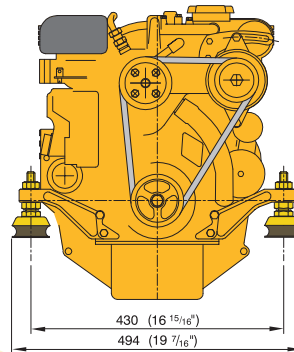
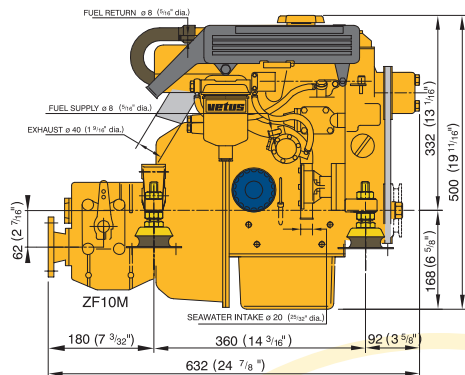
: fuse 10 A

**Cooling system**

: indirect cooling as standard

(keelcooling optional)

\* In accordance with ISO 8665



Certified within 5%

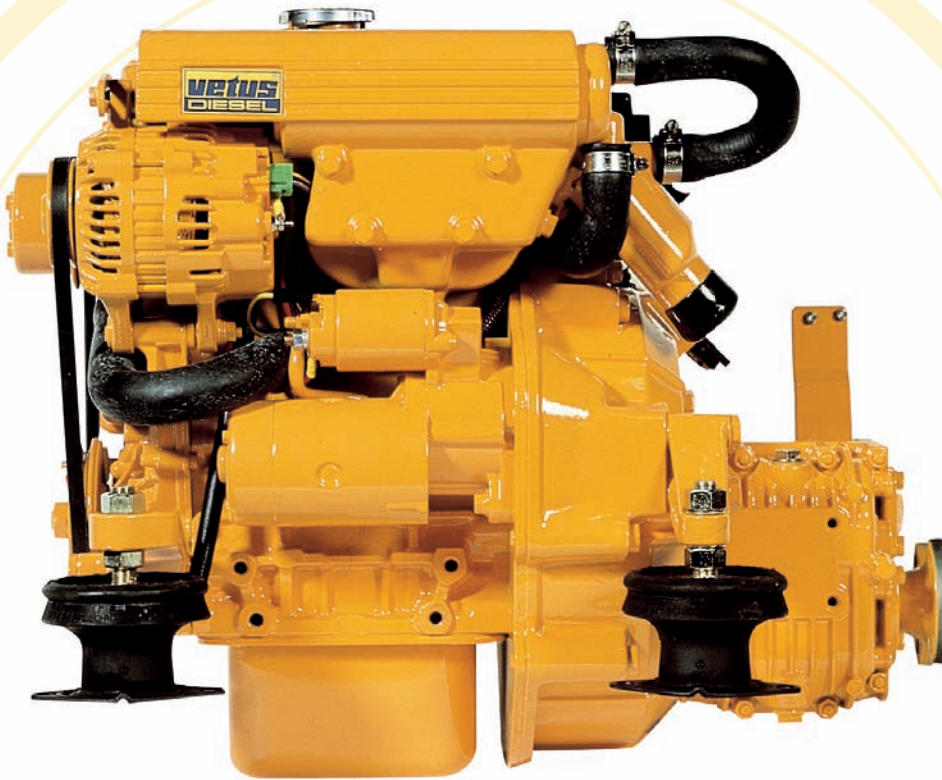
4 VETUS flexible engine mountings, type K25, are supplied with engine model M 2.D5



This instrument panel is supplied as standard: Model MP 10 VETUS waterproof engine instrument panel, provided with 5 monitoring lights (LED's) and an acoustic alarm. Instead of the engine panel shown, one of the other VETUS engine panels may be supplied. An engine panel for a second steering position may be supplied as well.





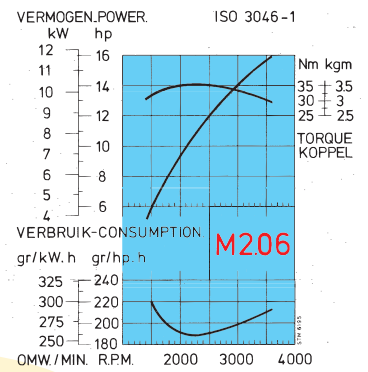
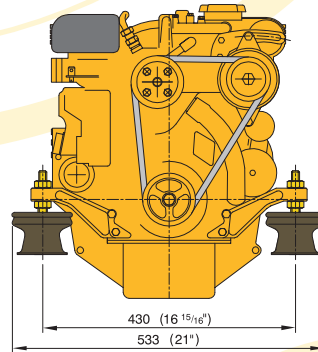
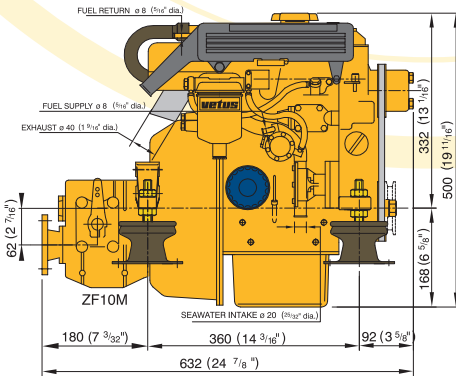


**M 2.06: 2 CYLINDERS, 11.8 KW (16 HP)**

**Technical data**

<b>Basic engine</b>	<b>M2.06</b>
Bore	IDI/4stroke/2cyl. in line/ NA diesel
Stroke	: Mitsubishi
Capacity	: 76 mm/3 inch
Number of cylinders	: 70 mm/2.8 inch
Compression ratio	: 635 cm <sup>3</sup> /39 cu.inch
Firing order	: 2
Alternator	: 23:1
* Max. output at flywheel (ISO 3046-1)	: 11.8 kW (16 hp)
* Max. output at propeller shaft (ISO 3046-1)	: 11.6 kW (15.8 hp)
Maximum rpm	: 3600
Torque at 3600 rpm	: 29.3 Nm
Fuel consumption at 2500 rpm	: 268 g/kW.h (196 g/hp.h)
Gearbox, standard	: ZF10
Ratio	: TMC40
Optional	: ZF10 2,05/2/2,72:1
	ZF15MIV 2,13/2,99:1
	ZF15MA 1,88/2,63:1
Dry weight (incl. gearbox)	: 98 kg/216 lbs
Suction height of fuel lift pump	: 1.5 m/5 ft
Max. installation angle (backwards)	: 15°
Max. lateral inclination angle (continuously)	: 25°
Max. lateral inclination angle (5 minutes max.)	: 30°
Calorifier connection	: standard
Warning lights and audible alarm for	: oil pressure, temperature (fresh and raw water), charging current
Control light for	: pre-heating
Electric circuit protection	: fuse 10 A
Cooling system	: indirect cooling as standard (keelcooling optional)

\* In accordance with ISO 8665

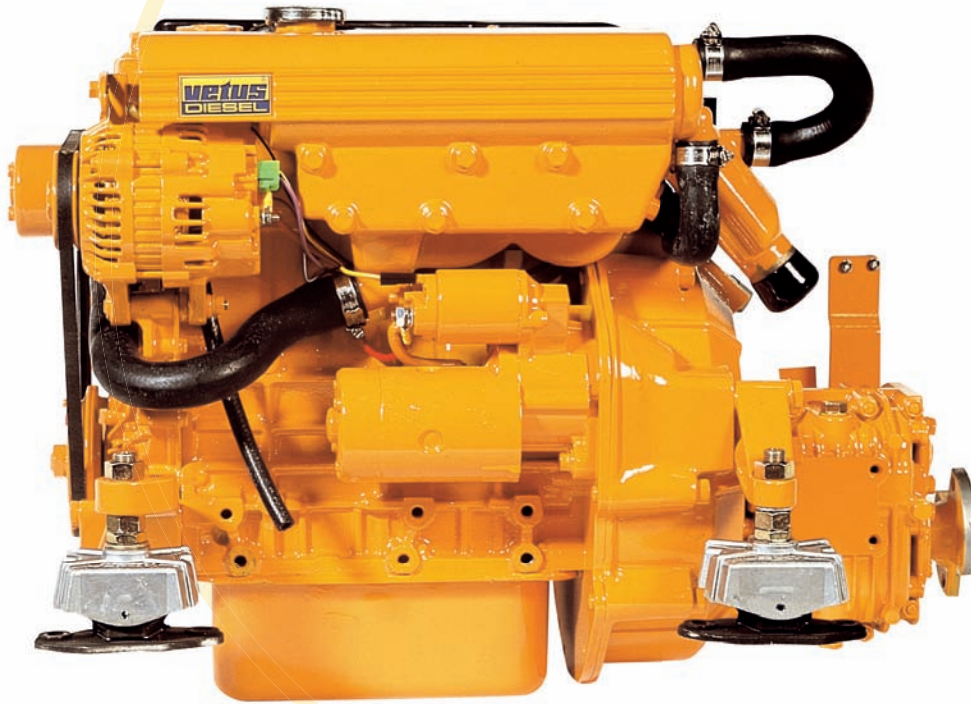


4 VETUS flexible engine mountings (hydrodampers) are supplied with engine model M 2.06.



This instrument panel is supplied as standard: Model MP 10 VETUS waterproof engine instrument panel, provided with 5 monitoring lights (LED's) and an acoustic alarm. Instead of the engine panel shown, one of the other VETUS engine panels may be supplied. An engine panel for a second steering position may be supplied as well.





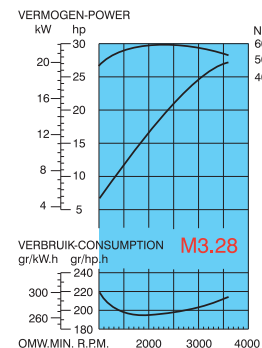
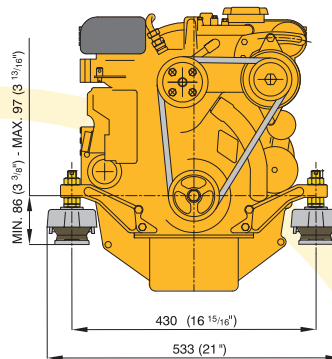
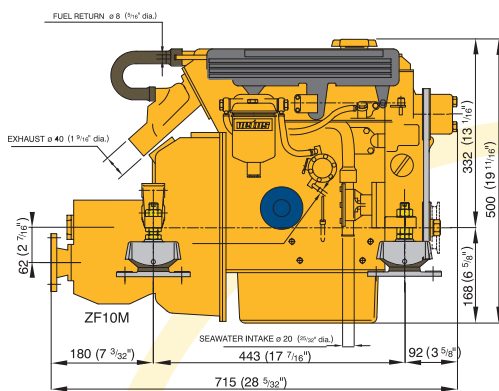
## M 3.28: 3 CYLINDERS, 20 KW (27.2 HP)

### Technical data

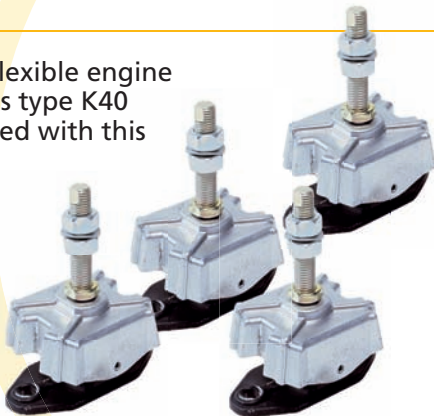
Basic engine	: Mitsubishi
Bore	: 76 mm/3 inch
Stroke	: 70 mm/2.8 inch
Capacity	: 952 cm <sup>3</sup> /58 cu.inch
Number of cylinders	: 3
Compression ratio	: 22:1
Firing order	: 1-3-2
Alternator	: 12 Volt - 75 A.
* Max. output at flywheel (ISO 3046-1)	: 20 kW (27.2 hp)
* Max. output at propeller shaft (ISO 3046-1)	: 19.3 kW (26.2 hp)
Maximum rpm	: 3600
Torque at 3600 rpm	: 53,1 Nm
Fuel consumption at 2600 rpm	: 270 g/kW.h (199 g/hp.h)
Gearbox, standard	: TMC40
Ratio	: 2,05/2,60:1
Optional	: ZF10 1,97/2,72:1 ZF15MIV 2,13/2,99:1 ZF12 1,14/2,63:1 ZF15MA 1,88/2,63:1

Dry weight (incl. TMC 40 gearbox)	: 123 kg/271 lbs
Suction height of fuel lift pump	: 1.5 m/5 ft
Max. installation angle (backwards)	: 15°
Max. lateral inclination angle (continuously)	: 25°
Max. lateral inclination angle (5 minutes max.)	: 30°
Calorifier connection	: standard
Warning lights and audible alarm for	: oil pressure, temperature (fresh and raw water), charging current
Control light for Automatic circuit breaker	: pre-heating
Cooling system	: 10 A. indirect cooling as standard. (keelcooling optional)

\* In accordance with ISO 8665

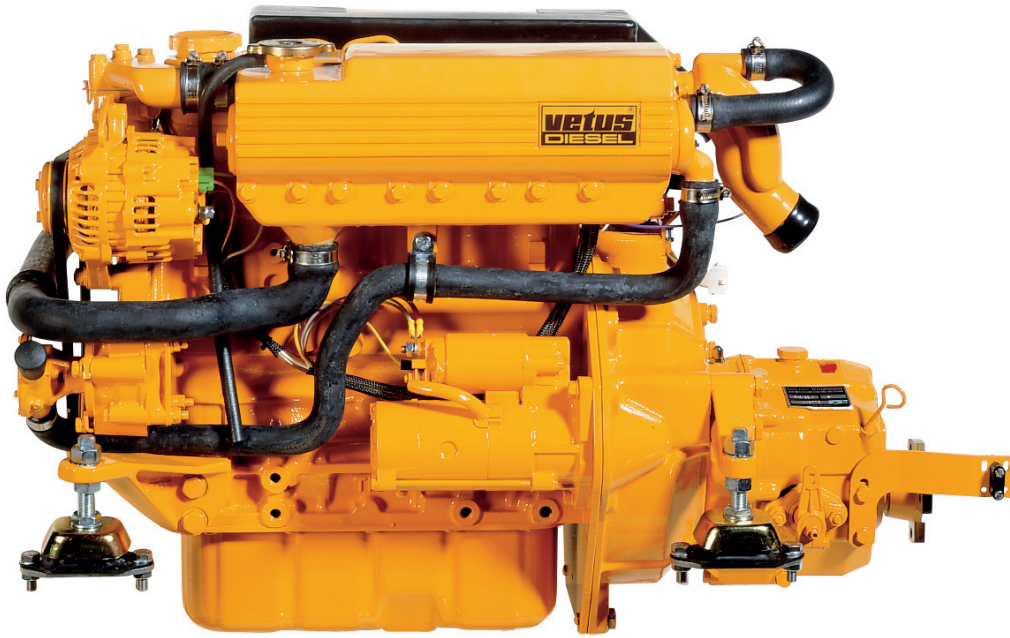


4 VETUS flexible engine mountings type K40 are supplied with this engine.



This waterproof VETUS instrument panel, provided with 5 control lights, a tach/hourmeter, a voltmeter, a buzzer and the starter switch, is standard supply. Instead of the engine panel shown, one of the other VETUS engine panels may be supplied. An engine panel for a second steering position may be supplied as well.





## M 4.15: 4 CYLINDERS, 24.3 KW (33 HP)

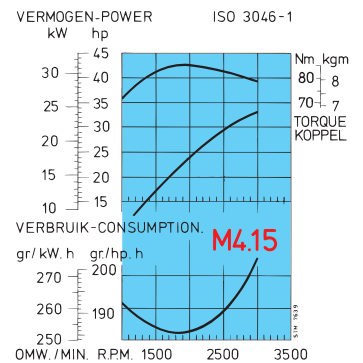
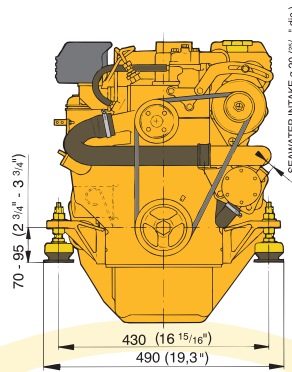
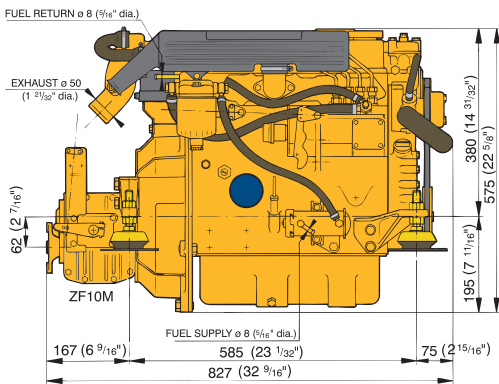
Engine models M4.15, M4.17 and M4.55 are available with an additional 110 A alternator as an option. With this second alternator fitted, the overall width of the engine increases to 640 mm.



### Technical data

<b>Basic engine</b>	<b>M 4.15</b>
Bore	IDI/4stroke/4cyl. in line/ NA diesel
Stroke	: Mitsubishi
Capacity	: 78 mm / 3.07 inch
Number of cylinders	: 78.5mm / 3.09 inch
Compression ratio	: 1500 cm <sup>3</sup> / 92 cu.inch
Firing order	: 4
Alternator	: 22:1
* Max. output at flywheel (ISO 3046-1)	: 1-3-4-2
* Max. output at propeller shaft (ISO 3046-1)	: 12 Volt - 110 A.
Maximum rpm	: 24.3 kW (33 hp)
Torque at 3000 rpm	: 23.6 kW (32.1 hp)
Fuel consumption at 1800 rpm	: 3000
Gearbox, standard	: 77.4 Nm
Ratio	: 252 g/kW.h (185 g/hp.h)
Optional	: TMC60
	: 2,0/2,5/2,94:1
Hydraulic	: ZF10 2,05:1
Dry weight (incl. gearbox)	: ZF12M 2,14/2,63:1
Suction height of fuel lift pump	: ZF12 2,14/2,63:1
Max. installation angle (backwards)	: ZF15M 1,88/2,63:1
Max. lateral inclination angle (continuously)	: ZF 25 1,97/2,8:1
Max. lateral inclination angle (5 minutes max.)	: ZF 25A 1,93/2,29/2,71:1
Calorifier connection	: 180 kg/397 lbs
Warning lights and audible alarm for	: 1.5 m/5 ft
	: 15°
	: 25°
	: 30°
Control light for	: standard
Electric circuit protection	: oil pressure, temperature (fresh and raw water), charging current
Tachometer	: pre-heating
Cooling system	: fuse 10 A
	: electronic
	: Indirect cooling as standard (keelcooling optional)

\* In accordance with ISO 8665



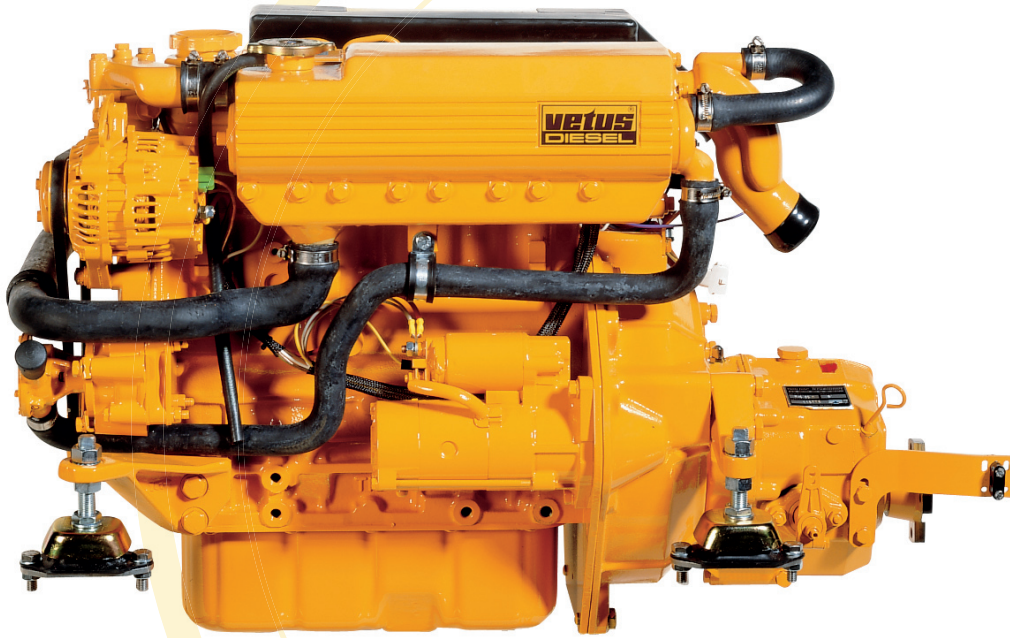
Certified within 5%

4 VETUS flexible engine mountings, type K75 are supplied with this engine.



This waterproof VETUS instrument panel, provided with 5 control lights, a tachometer, a voltmeter, a buzzer and the starter switch, is standard supply. Instead of the engine panel shown, one of the other VETUS engine panels may be supplied. An engine panel for a second steering position may be supplied as well.





## M 4.17: 4 CYLINDERS, 30.9 KW (42 HP)

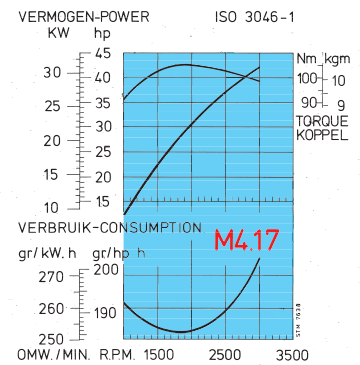
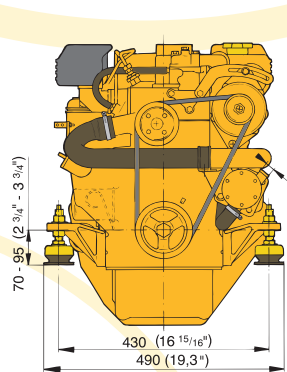
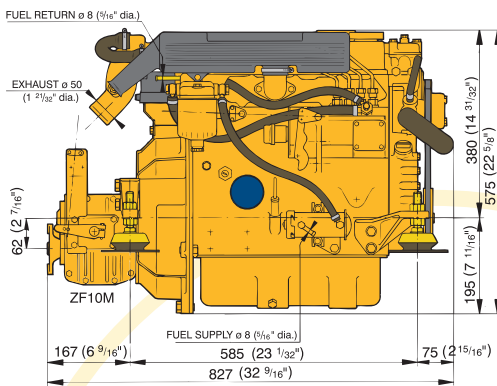
Engine models M4.15, M4.17 and M4.55 available with an additional 110 A alternator as an option. With this second alternator fitted, the overall width of the engine increases to 640 mm.



### Technical data

Basic engine	: IDI/4stroke/4cyl. in line/NA diesel
Bore	: 78 mm / 3.07 inch
Stroke	: 92 mm / 3.62 inch
Capacity	: 1758 cm <sup>3</sup> / 108 cu.inch
Number of cylinders	: 4
Compression ratio	: 22:1
Firing order	: 1-3-4-2
Alternator	: 12 Volt - 110 A.
* Max. output at flywheel (ISO 3046-1)	: 30.9 kW (42 hp)
* Max. output at propeller shaft (ISO 3046-1)	: 30 kW (40.8 hp)
Maximum rpm	: 3000
Torque at 3000 rpm	: 98 Nm
Fuel consumption at 1800 rpm	: 252 g/kW.h (185 g/hp.h)
Gearbox, standard	: TMC60
Ratio	: 2/2,5/2,94:1
Optional	: ZF10 2,05:1 ZF12M 2,14/2,63:1 ZF12 2,14/2,63:1 ZF15MA 1,88/2,63:1 ZF 25 1,97/2,8:1 ZF 25A 1,93/2,29/2,71:1
Hydraulic	
Dry weight (incl. gearbox)	: 185 kg/408 lbs
Suction height of fuel lift pump	: 1.5 m/5 ft
Max. installation angle (backwards)	: 15°
Max. lateral inclination angle (continuously)	: 25°
Max. lateral inclination angle (5 minutes max.)	: 30°
Calorifier connection	: standard
Warning lights and audible alarm for	: oil pressure, temperature (fresh and raw water), charging current
Control light for	: pre-heating
Electric circuit protection	: fuse 10 A
Tachometer	: electronic
Cooling system	: Indirect cooling as standard (keelcooling optional)

\* In accordance with ISO 8665



Certified within 5%

4 VETUS flexible engine mountings, type K75 are supplied with this engine.



This waterproof VETUS instrument panel, provided with 5 control lights, a tach/hourmeter, a voltmeter, a buzzer and the starter switch, is standard supply. Instead of the engine panel shown, one of the other VETUS engine panels may be supplied. An engine panel for a second steering position may be supplied as well.





## M 4.55: 4 CYLINDERS, 38.3 KW (52 HP)

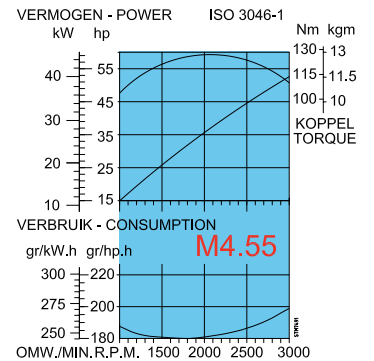
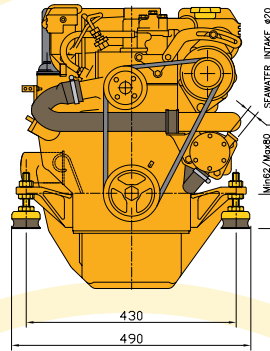
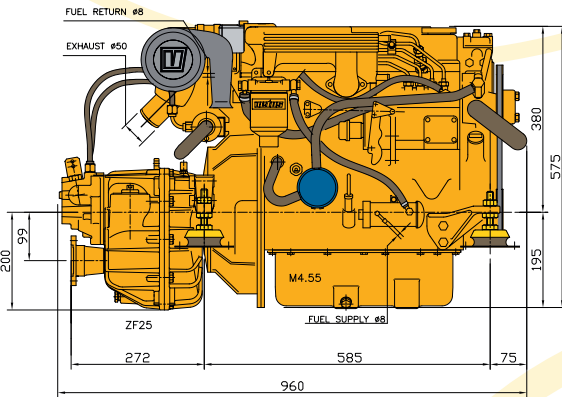
Engine models M4.15, M4.17 and M4.55 are available with an additional 110 A alternator as an option. With this second alternator fitted, the overall width of the engine increases to 640 mm.



### Technical data

Basic engine	: IDI/4stroke/4cyl. in line/ <b>turbo-charged</b> diesel
Bore	: 78 mm / 3.07 inch
Stroke	: 92 mm / 3.62 inch
Capacity	: 1758 cm <sup>3</sup> / 108 cu.inch
Number of cylinders	: 4
Compression ratio	: 22:1
Firing order	: 1-3-4-2
Alternator	: 12 Volt - 110 A.
* Max. output at flywheel (ISO 3046-1)	: 38,3 kW (52 hp)
* Max. output at propeller shaft (ISO 3046-1)	: 37,1 kW (51 hp)
Maximum rpm	: 3000
Torque at 3000 rpm	: 127 Nm
Fuel consumption at 1800 rpm	: 244 g/kW.h (179 g/hp.h)
Gearbox, standard	: ZF25 1,97/2,8:1
Optional	: ZF25A 1,55/1,93/2,29/2,71:1
Dry weight (incl. gearbox)	: 192 kg/432 lbs
Suction height of fuel lift pump	: 1.5 m/5 ft
Max.installation angle (backwards)	: 15°
Max. lateral inclination angle (continuously)	: 25°
Max. lateral inclination angle (5 minutes max.)	: 30°
Calorifier connection	: standard
Warning lights and audible alarm for	: oil pressure, temperature (fresh and raw water), charging current
Control light for	: pre-heating
Electric circuit protection	: fuse 10 A
Tachometer	: electronic
Cooling system	: Indirect cooling as standard (keelcooling optional)

\* In accordance with ISO 8665



Certified within 5%

4 VETUS flexible engine mountings, type K75 are supplied with this engine.



This waterproof VETUS instrument panel, provided with 5 control lights, a tach/hourmeter, a voltmeter, a buzzer and the starter switch, is standard supply. Instead of the engine panel shown, one of the other VETUS engine panels may be supplied. An engine panel for a second steering position may be supplied as well.





## *The revelation of 2007*

VETUS will introduce, during the winter season 2007/2008, a completely new range of marine engines, high-powered and light in weight.

A tip of the curtain lifted:

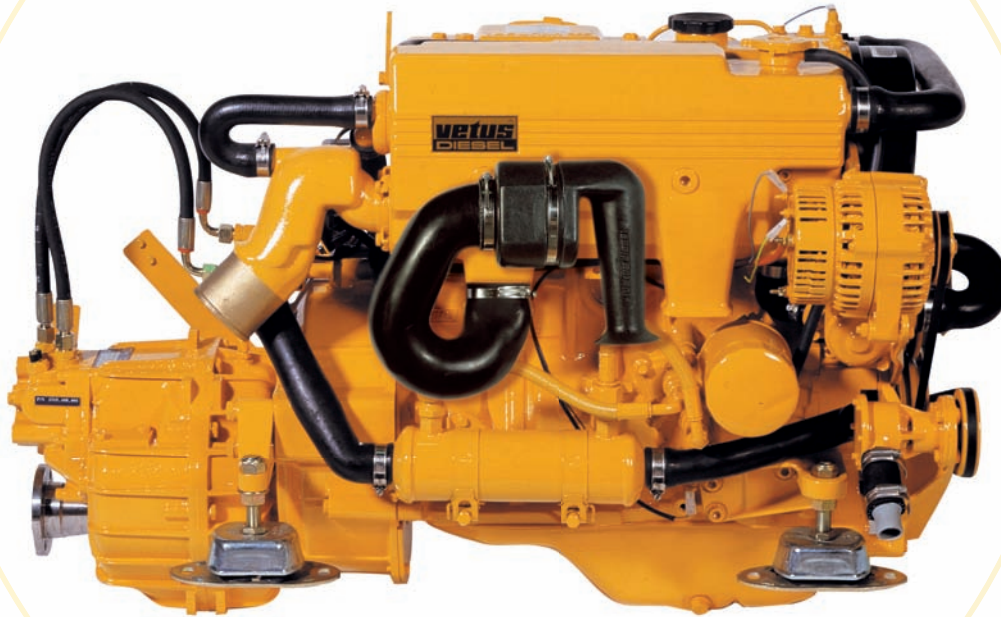
**Model VF4.140 E** 4 cylinders, 102 kW (140 hp)

**Model VF4.170 E** 4 cylinders, 125 kW (170 hp)

**Model VF5.220 E** 5 cylinders, 162 kW (220 hp)

**Model VF5.250 E** 5 cylinders, 184 kW (250 hp)

More news will follow shortly...

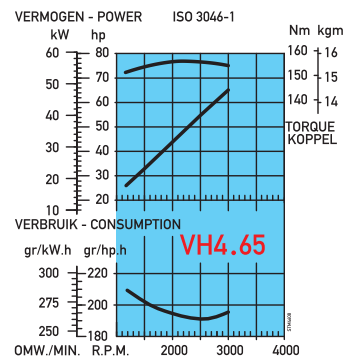
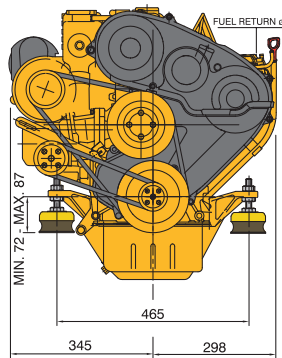
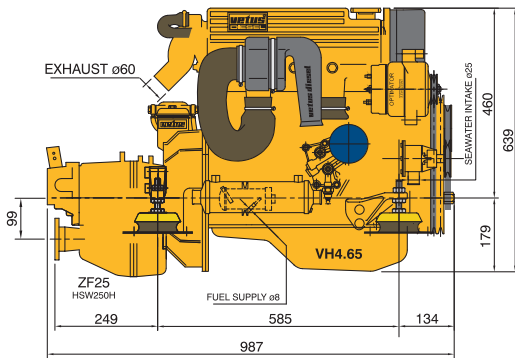


**VH4.65: 4 CYLINDERS, 48 KW (65,3 HP)**

**Technical data:**

<b>VH 4.65</b>	IDI/4stroke/4cyl. in line/ NA diesel
Basic engine	: Hyundai
Bore	: 91.1 mm/3.58 inch
Stroke	: 100 mm/3.94 inch
Capacity	: 2607 cm <sup>3</sup> /159 cu.inch
Number of cylinders	: 4
Compression ratio	: 22:1
Firing order	: 1-3-4-2
Alternator	: 12 Volt - 115 A
* Max. output at flywheel (ISO 3046-1)	: 48 kW (65.3 hp)
* Max. output at propeller shaft (ISO 3046-1)	: 46.6 kW (63.4 hp)
Maximum rpm	: 3000
Torque at 2200 rpm	: 170 Nm
Gearbox, standard	: ZF25
Ratio	: 1.97/2.8:1
Optional hydraulic	: ZF25A 1.93/2.29/2.71:1
Dry weight (incl. ZF25 gearbox)	: 240 kg / 528 lbs
Suction height of fuel lift pump	: 1.5 m / 5 ft
Max. installation angle (backwards)	: 15°
Max. lateral inclination angle (continuously)	: 25°
Max. lateral inclination angle (5 minutes max.)	: 30°
Calorifier connection	: standard
Warning lights and audible alarm for	: oil pressure, temperature (fresh and raw water), charging current
Control light for	: pre-heating
Electric circuit protection	: fuse 10 A
Cooling system	: indirect cooling as standard (Keelcooling optional)

\* In accordance with ISO 8665



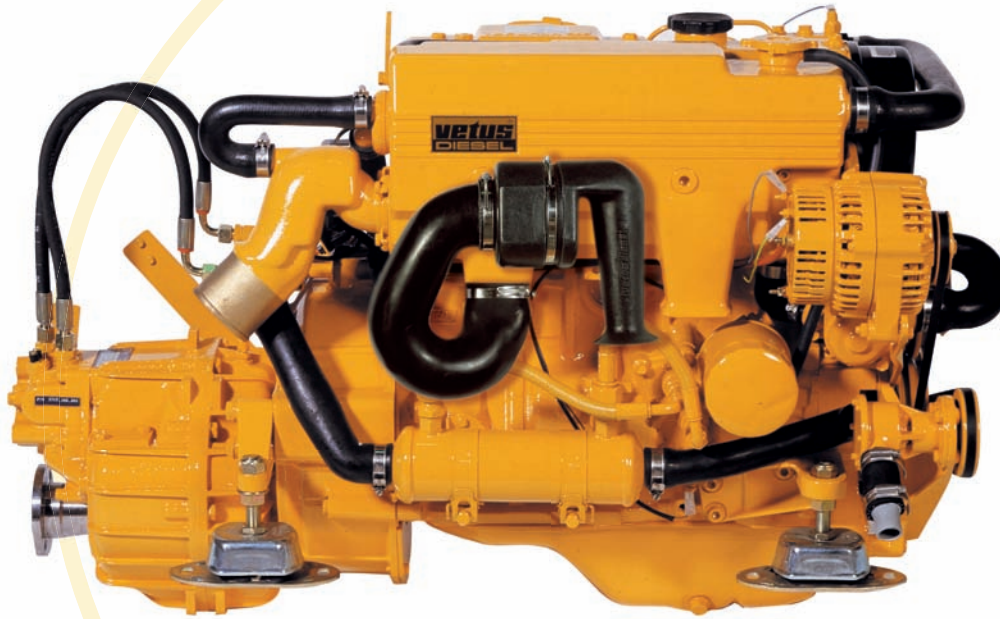
Certified within 5%

4 VETUS flexible engine mountings, type HY are supplied with this engine.



This waterproof VETUS instrument panel, provided with 5 control lights, a tachometer, a voltmeter, a buzzer and the starter switch, is standard supply. Instead of the engine panel shown, one of the other VETUS engine panels may be supplied. An engine panel for a second steering position may be supplied as well.



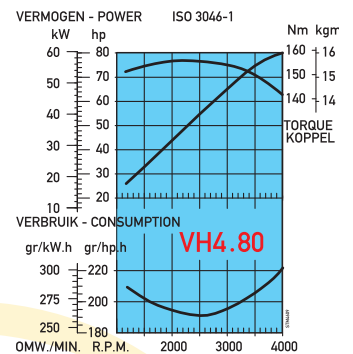
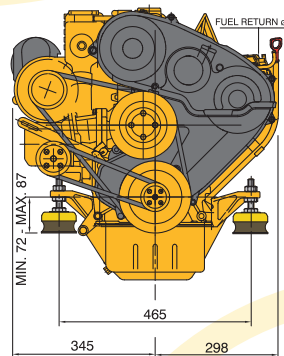
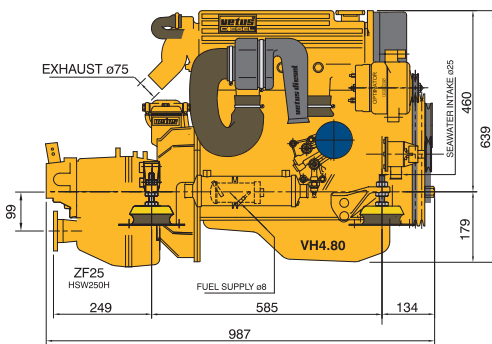


## VH4.80: 4 CYLINDERS, 59 KW (80.3 HP)

### Technical data:

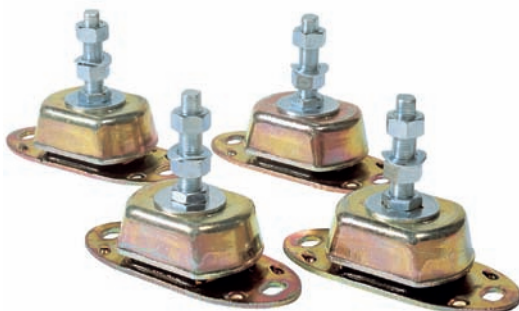
<b>Basic engine</b>	<b>VH 4.80</b>
	IDI/4stroke/4cyl. in line/NA diesel
	Hyundai
Bore	: 91.1 mm/3.58 inch
Stroke	: 100 mm/3.94 inch
Capacity	: 2607 cm <sup>3</sup> /159 cu.inch
Number of cylinders	: 4
Compression ratio	: 22:1
Firing order	: 1-3-4-2
Alternator	: 12 Volt - 115 A
* Max. output at flywheel (ISO 3046-1)	: 59 kW (80.3 hp)
* Max. output at propeller shaft (ISO 3046-1)	: 57.2 kW (77.6 hp)
Maximum rpm	: 4000
Torque at 2200 rpm	: 170 Nm
Gearbox, standard	: ZF25
Ratio	: 1.97/2.8:1
Optional hydraulic	: ZF25A 1.93/2.29/2.71:1
Dry weight (incl. ZF25 gearbox)	: 245 kg / 539 lbs
Suction height of fuel lift pump	: 1.5 m / 5 ft
Max. installation angle (backwards)	: 15°
Max. lateral inclination angle (continuously)	: 25°
Max. lateral inclination angle (5 minutes max.)	: 30°
Calorifier connection	: standard
Warning lights and audible alarm for	: oil pressure, temperature (fresh and raw water), charging current
Control light for	: pre-heating
Electric circuit protection	: fuse 10 A
Cooling system	: indirect cooling as standard (Keelcooling optional)

\* In accordance with ISO 8665



Certified within 5%

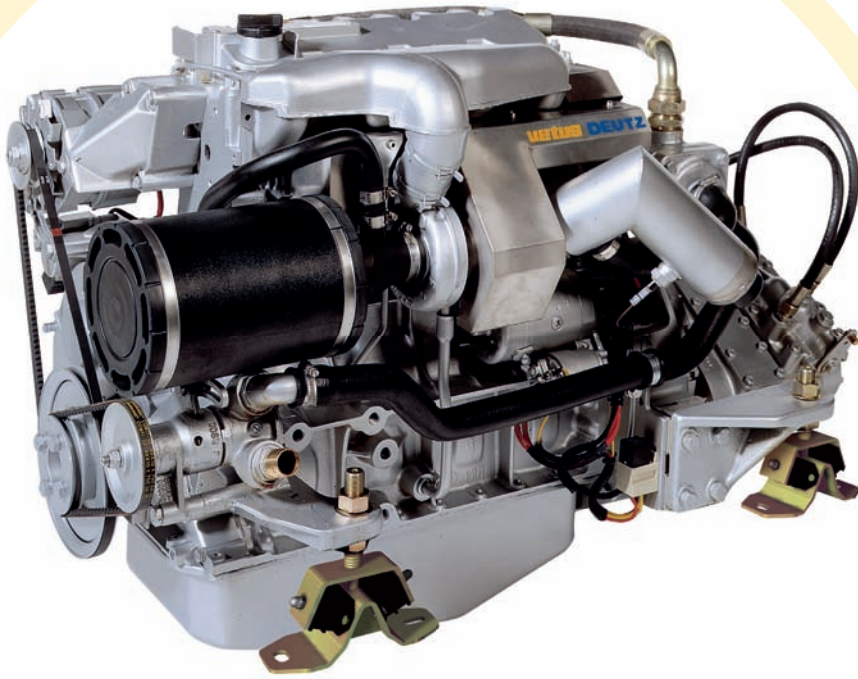
4 VETUS flexible engine mountings, type HY are supplied with this engine.



This waterproof VETUS instrument panel, provided with 5 control lights, a tachometer/hourmeter, a voltmeter, a buzzer and the starter switch, is standard supply. Instead of the engine panel shown, one of the other VETUS engine panels may be supplied. An engine panel for a second steering position may be supplied as well.







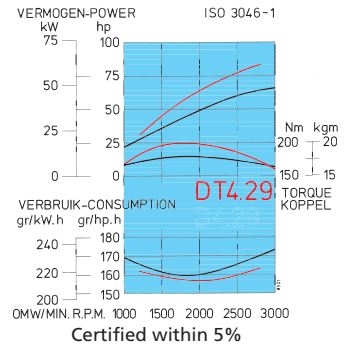
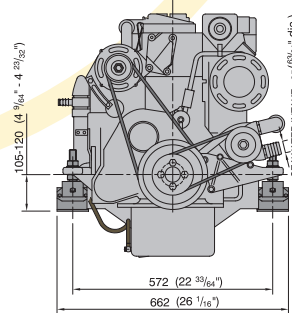
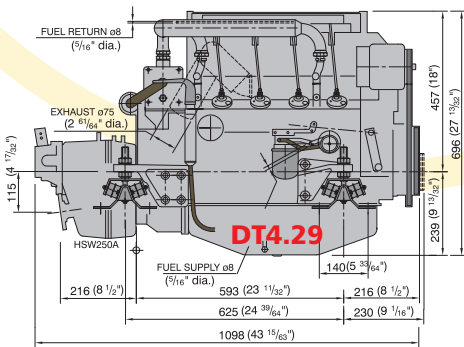
The VETUS DEUTZ marine diesel engine model DT4.29 is noteworthy due to the fact that the internal cooling is not ensured by the usual cooling liquid, but instead by the lubricating oil, stored in the engine sump. In turn, the lubricating oil is cooled by means of an oil cooler, which has been integrated into the raw water cooling circuit. The owner has the advantage that there is no need for checking and/or maintenance of the internal cooling circuit. And the oil level has always been the object of your close scrutiny; right? The starting-point for the development of this engine was the most rigid exhaust emission regulation of today and of the future. Like its "bigger brothers", this VETUS DEUTZ engine features, for each cylinder, an individual fuel injection pump, which is integrated in the engine block.

### And the result?

- Extremely low exhaust emission values.
- Very economical fuel consumption.
- Owing to its revolutionary fuel injection system, this engine meets the most stringent international exhaust emission regulations, including the so-called "Lake Constance" requirements, phase II (B.S.O. II).
- Excellent thermal efficiency.

The very favourable thermal efficiency is enhanced by the fact that the turbo-compressor and the engine's exhaust manifold are **not** water-cooled. A special double-walled, stainless steel insulation device has been fitted instead. Another advantage being the **relatively little and well-controlled** quantity of raw water injected in the exhaust assembly, thus ensuring **minimum back pressure**.

## DT4.29: 4 CYLINDERS, TURBO-CHARGED, 61 KW (83 HP)



### Technical data :

Basic engine	: Turbo-charged
Bore	: Deutz BF4M1011F
Stroke	: 91 mm / 3.58 inch
Capacity	: 112 mm / 4.41 inch
Number of cylinders	: 2910 cm <sup>3</sup> / 177.5 cu inch
Compression ratio	: 4
Firing order	: 17:1
Alternator	: 1-3-4-2
Max. output at flywheel (ISO 3046-1)*	: 12 Volt - 115 A
Max. output at propeller shaft (ISO 3046-1)*	: 61 kW (83 hp)
Maximum rpm	: 59 kW (80 hp)
Torque at maximum rpm	: 2800
Fuel consumption	: 208 Nm
Gearbox, standard	: 207 g/kW.h (151 g/hp.h)
Ratio	: ZF25A
Optional	: 1.93/2.29/2.71:1
	: ZF25

Dry weight (incl. standard gearbox)	: 1.97/2.80:1
Suction height of fuel lift pump	: Newage PRM 260
Max. installation angle (backwards)	: 2.09/2.82:1
Max. lateral inclination angle (continuously)	: 306 kg / 673 lbs
Max. lateral inclination angle (5 minutes max.)	: 0.5 m / 1.6 ft
Calorifier connection	: 15°
Warning lights and audible alarm for	: 225°
	: 30°
	: standard
Revolution counter	: oil pressure, temperature (oil and raw water), charging current
	: electronic

\* In accordance with ISO 8665



This waterproof VETUS instrument panel, provided with 6 control-lights, a tachometer, a voltmeter, a buzzer and the starter switch, is standard supply. Instead of the engine panel shown, one of the other VETUS engine panels may be supplied. An engine panel for a second steering position may be supplied as well.



4 VETUS flexible engine mountings, type STM8700 (standard supply).

**VETUS ELECTRONIC ENGINE MANAGEMENT, TYPE EMR2**

VETUS DEUTZ engine types DT44 and DT66 are also available with EMR electronic engine management. The VETUS EMR2 is a powerful microprocessor unit, deriving its information from a number of engine sensors. All engine functions are then controlled automatically and accurately under all operational circumstances. For example: the engine can deliver more power at idling speed, so that hydraulic applications, such as a bow thruster can be controlled efficiently. Furthermore, the engine is protected against low oil pressure, high cooling water temperature, high air intake temperature etc. If a digital instrument panel is connected, more functions can be monitored through the CAN-bus, such as power output, fuel consumption, etc. With the VETUS EMR2, these engines may be connected to virtually all makes of electronic engine control, thus eliminating long push-pull cable runs, with their inevitable lost movement and friction.

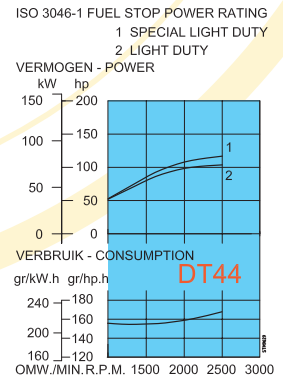
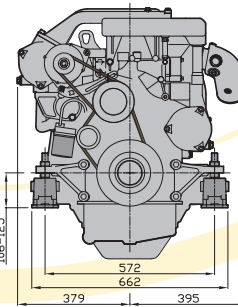
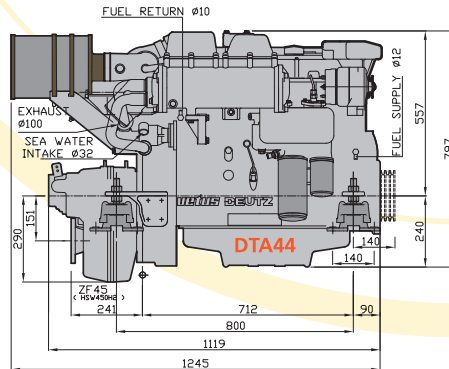
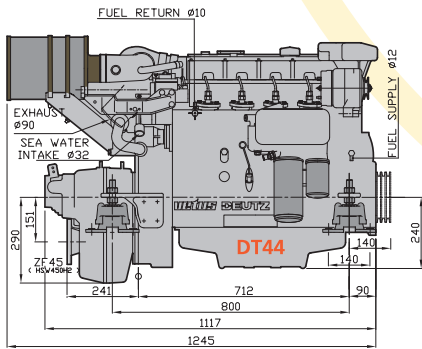


**2.500 RPM**

**DT 44 - 4 CYLINDER, 84 KW (114 HP)**  
**DTA 44 - 4 CYLINDER, 103 KW (140 HP)**

**Technical specifications:**

- Voltage: 12 and 24 Volt DC (voltage range: 10 – 36 V)
- Protection factor: IP66
- Ambient temperature range: - 40 to 85° C.
- Dimensions: 231 x 204 x 62 mm (l x w x h)
- Instrument output: via CAN bus protocol, SAE-J1939
- Electronic engine controls:
  - Voltage: 0,5 – 4,5 V
  - CAN-bus, SAE-J1939
  - PWM, frequency 100 Hz, 5 – 95% pulse range

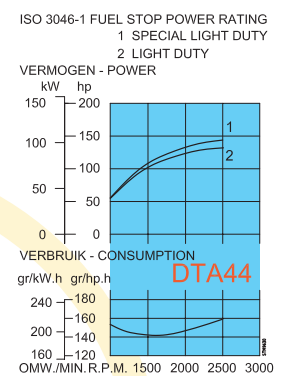


**Technical data**

	<b>: DT44</b>	<b>: DTA44</b>
Based on	Turbo-charged Deutz BF4M1012	Turbo-charged/after cooled Deutz BF4M1012C
Bore	: 101 mm	101 mm
Stroke	: 126 mm	126 mm
Capacity	: 4038 cm <sup>3</sup>	4038 cm <sup>3</sup>
Number of cylinders	: 4	4
Compression ratio	: 18.4:1	18.4:1
Firing order	: 1-3-4-2	1-3-4-2
Alternator	: 12 Volt - 115 A	12 Volt - 115 A
Max. output at flywheel (ISO 3046-1)*	: 84 kW (114 hp)	103 kW (140 hp)*
Max. output at propeller shaft (ISO 3046-1)*	: 80.1 kW (109.5 hp)	98.9 kW (134,4 hp)
Maximum rpm	: 2500	2500
Torque at maximum rpm	: 320 Nm	394 Nm
Fuel consumption	: 208 g/kW.h(152g/hp.h)	202 g/kW.h(146g/hp.h)
Gearbox, standard	: ZF45	ZF45
Ratio	: 2.2/2.5/3:1	2.2/2.5/3:1
Optional	: ZF45A	ZF45A
	1,51/2,03/2,44:1	1,51/2,03/2,44:1
Dry weight (incl. standard gearbox)	: 513 kg / 1129 lbs	532 kg / 1170 lbs
Max. installation angle (backwards)	: 15°	15°
Max. lateral inclination angle (continuously)	: 30°	30°
Calorifier connection	: standard	standard
Cooling system, standard	: heat exchanger cooling (dual circuit)	heat exchanger cooling (dual circuit)
Optional	: keel-cooling	

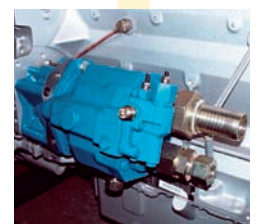


This waterproof VETUS instrument panel, provided with 6 control-lights, a combined tachometer/ hourmeter, temperature gauge, oil pressure gauge, a buzzer and the starter switch, is standard supply. Instead of the engine panel shown, one of the other VETUS engine panels may be supplied. An engine panel for a second steering position may be supplied as well.

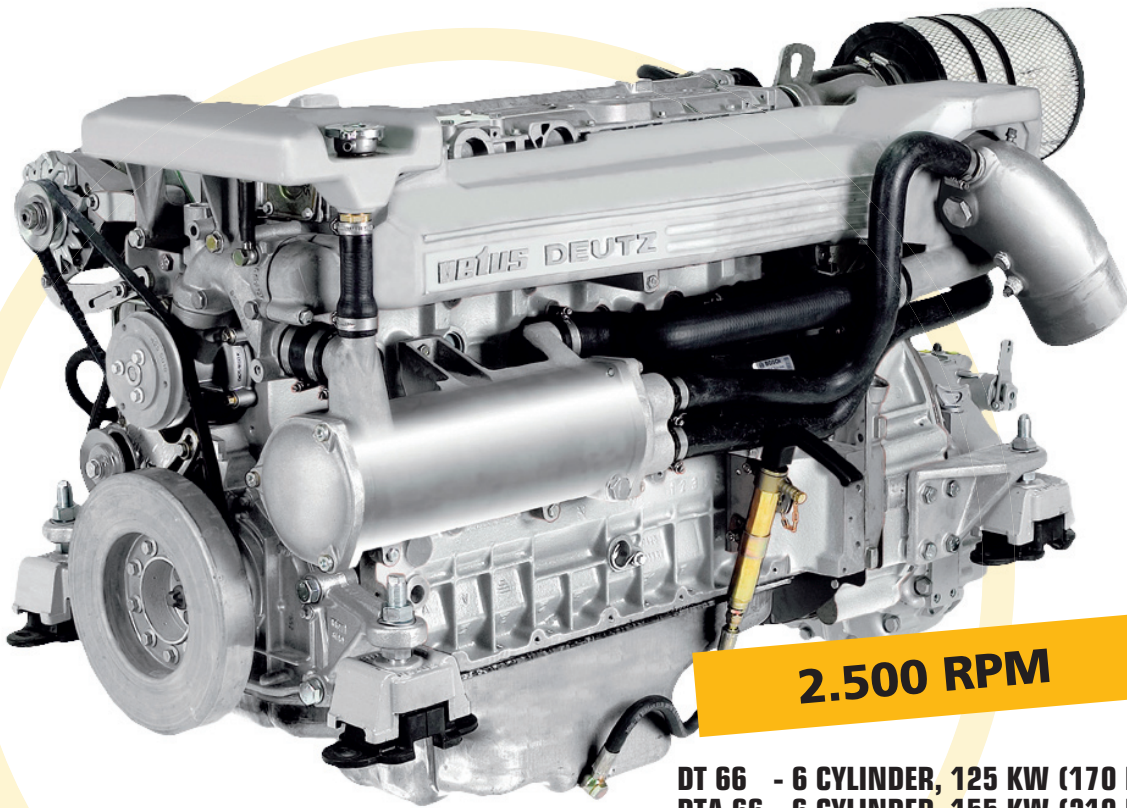


4 VETUS flexible engine mountings, type LMX140 (standard supply).

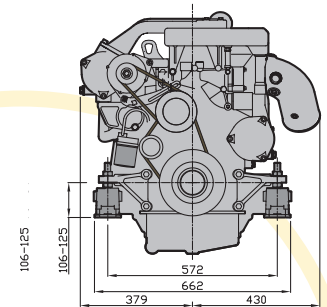
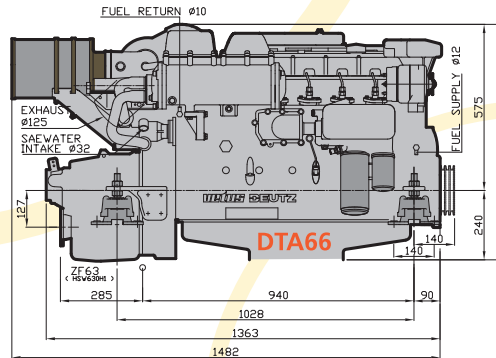
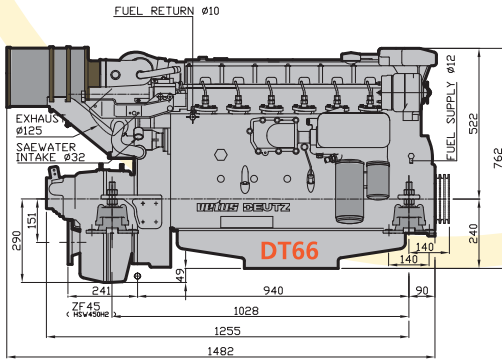
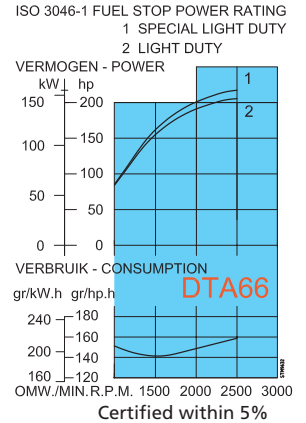
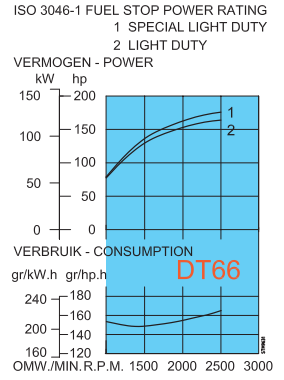
All VETUS DEUTZ engines above 74 kW have a PTO connection for a hydraulic pump as standard. If other engine makes do not provide such a device, please consult VETUS.



\* In accordance with ISO 8665



**DT 66 - 6 CYLINDER, 125 KW (170 HP)**  
**DTA 66 - 6 CYLINDER, 155 KW (210 HP)**



**Technical data**

	<b>DT66</b>	<b>DTA66</b>
	Turbo-charged	Turbo-charged/after cooled
	Deutz BF6M1012	Deutz BF6M1012C
Bore	: 101 mm	101 mm
Stroke	: 126 mm	126 mm
Capacity	: 6057 cm <sup>3</sup>	6057 cm <sup>3</sup>
Number of cylinders	: 6	6
Compression ratio	: 18.4:1	18.4:1
Firing order	: 1-5-3-6-2-4	1-5-3-6-2-4
Alternator	: 12 Volt - 115 A	12 Volt - 115 A
Max. output at flywheel (ISO 3046-1)*	: 125 kW (170 hp)	155 kW (210 hp)
Max. output at propeller shaft (ISO 3046-1)*	: 120 kW (163.2 hp)	148.8 kW (201.6 hp)
Maximum rpm	: 2500	2500
Torque at 2650 rpm	: 478 Nm	590 Nm
Fuel consumption	: 208 g/kW.h(152 g/hp.h)	202 g/kW.h(146 g/hp.h)
Gearbox, standard	: ZF45	ZF63
Ratio	: 2.2/2,5/3,0:1	1,51/1,93/2,5/2,78:1
Optional	: ZF45A 1,51/2,03/2,44:1 ZF63A 2,52:1	ZF63A 1,56/2,04/2,52:1
Dry weight (incl. standard gearbox)	: 652 kg / 1434 lbs	657 kg / 1445 lbs
Max. installation angle (backwards)	: 15°	15°
Max. lateral inclination angle (continuously)	: 30°	30°
Calorifier connection	: standard	standard
Cooling system, standard	: heat exchanger cooling (dual circuit)	heat exchanger cooling (dual circuit)
Optional	: keel-cooling	

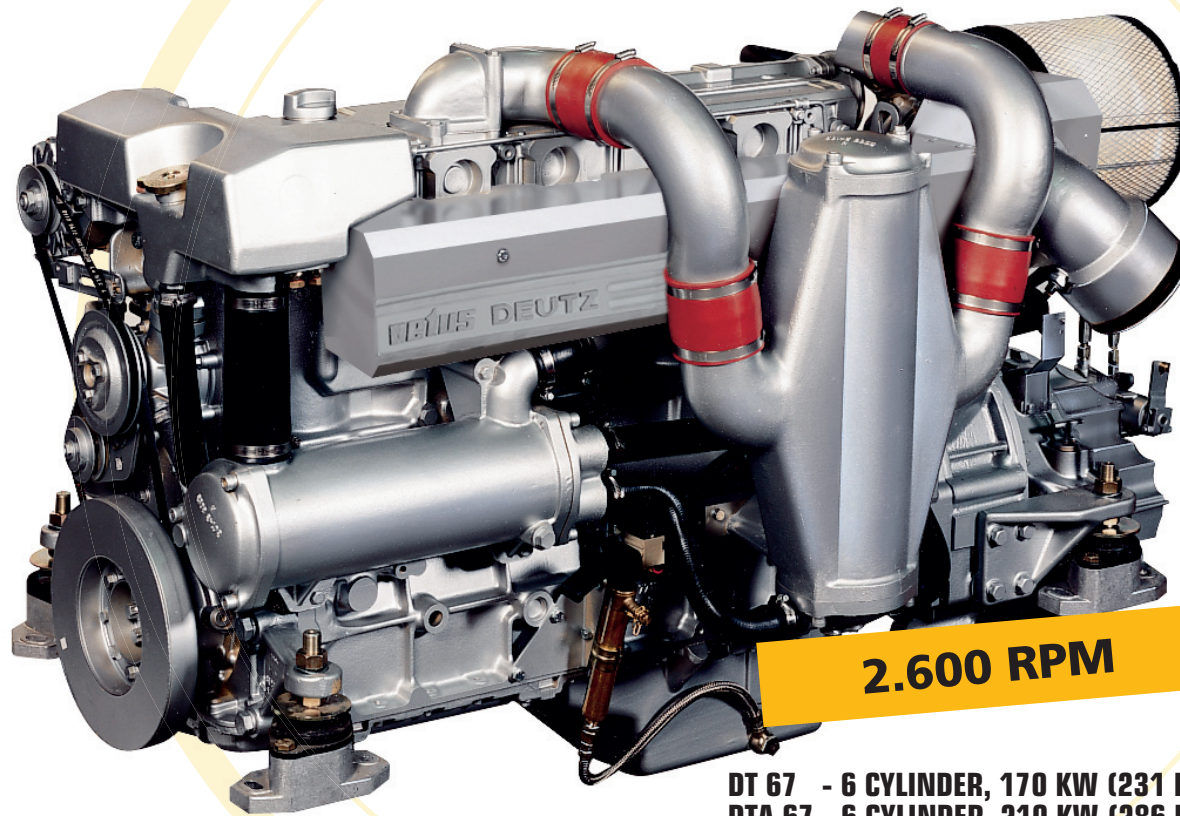


This waterproof VETUS instrument panel, provided with 6 control-lights, a combined tach/ hourmeter, temperature gauge, oil pressure gauge, a buzzer and the starter switch, is standard supply. Instead of the engine panel shown, one of the other VETUS engine panels may be supplied. An engine panel for a second steering position may be supplied as well.

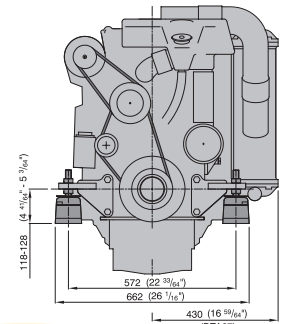
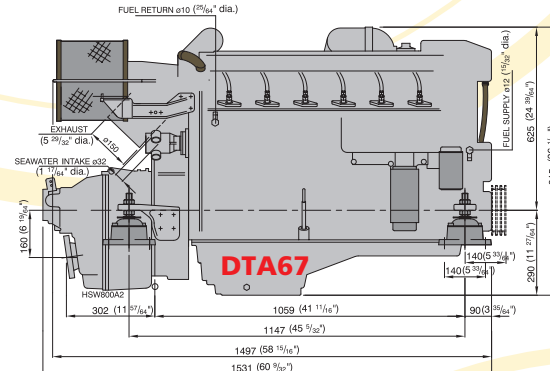
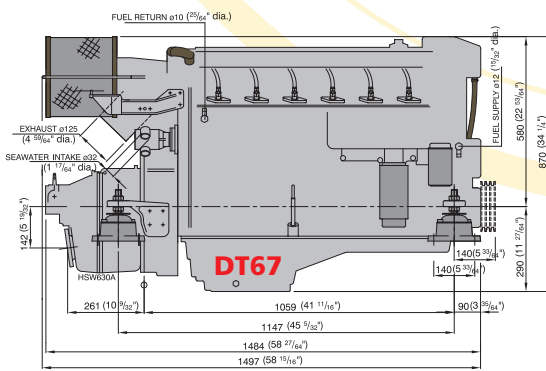
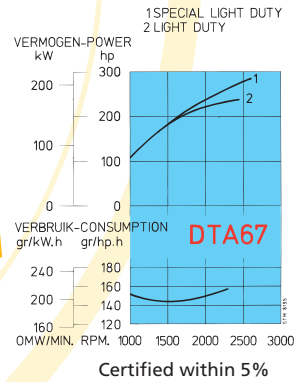
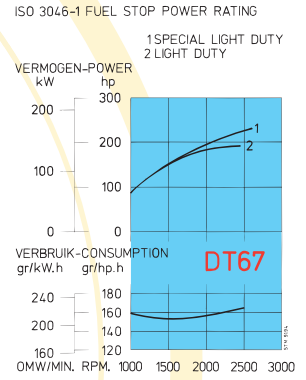
4 VETUS flexible engine mountings, type LMX210 (standard supply).



All VETUS DEUTZ engines above 74 kW have a PTO connection for a hydraulic pump as standard. If other engine makes do not provide such a device, please consult VETUS.



**DT 67 - 6 CYLINDER, 170 KW (231 HP)**  
**DTA 67 - 6 CYLINDER, 210 KW (286 HP)**



**Technical data**

	<b>DT67</b>	<b>DTA67</b>
	Turbo-charged	Turbo-charged/after cooled
	Deutz BF6M1013E	Deutz BF6M1013EC
Bore	: 108 mm / 4.25 inch	108 mm / 4.25 inch
Stroke	: 130 mm / 5.12 inch	130 mm / 5.12 inch
Capacity	: 7140 cm <sup>3</sup> / 435.5 cu.inch	7140 cm <sup>3</sup> / 435.5 cu.inch
Number of cylinders	: 6	6
Compression ratio	: 17.6:1	17.6:1
Firing order	: 1-5-3-6-2-4	1-5-3-6-2-4
Alternator	: 12 Volt - 115 A	12 Volt - 115 A
Max. output at flywheel (ISO 3046-1)*	: 170 kW (231 hp)	210 kW (286 hp)
Max. output at propeller shaft (ISO 3046-1)*	: 163 kW (222 hp)	202 kW (274 hp)
Maximum rpm	: 2600	2600
Torque at 2600 rpm	: 624 Nm	773 Nm
Fuel consumption	: 200 g/kW.h(146g/hp.h)	195 g/kW.h(143g/hp.h)
Gearbox, standard	: ZF63A	ZF80A
Ratio	: 1.56/2.04:1	1.57/1.75/1.96/2.5:1
Optional	: ZF63 1.51/1.93/2.5/2.78:1	
Dry weight (incl.standard gearbox)	: 777 kg / 1709 lbs	826 kg / 1817 lbs
Max. installation angle (backwards)	: 15°	15°
Max. lateral inclination angle (continuously)	: 30°	30°
Calorifier connection	: standard	standard
Cooling system, standard	: heat exchanger cooling (dual circuit)	heat exchanger cooling (dual circuit)
Optional	: keelcooling	



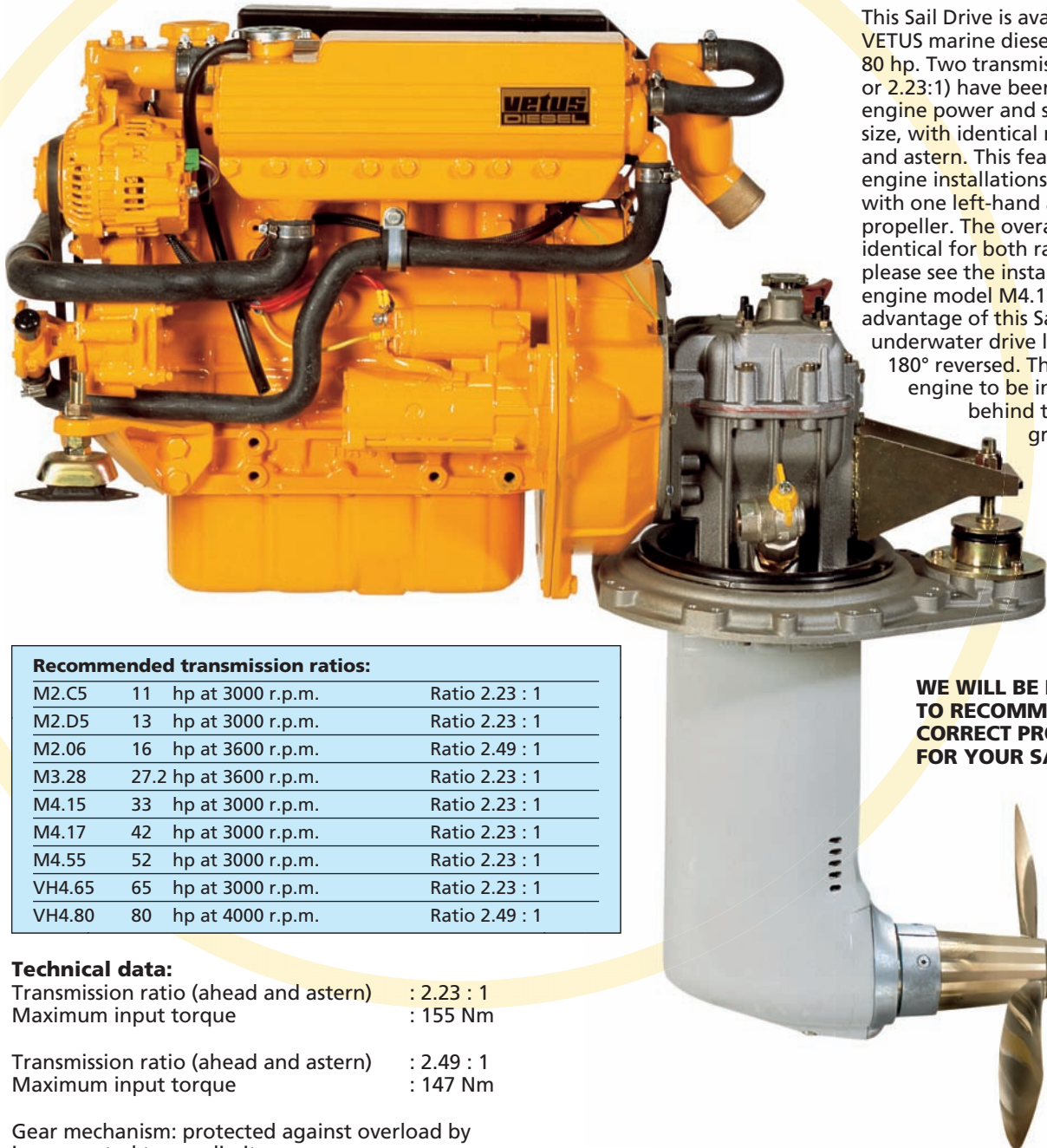
This waterproof VETUS instrument panel, provided with 6 control-lights, a combined tach/ hourmeter, temperature gauge, oil pressure gauge, a buzzer and the starter switch, is standard supply. Instead of the engine panel shown, one of the other VETUS engine panels may be supplied. An engine panel for a second steering position may be supplied as well.

4 VETUS flexible engine mountings, type LMX340 (standard supply).



All VETUS DEUTZ engines above 74 kW have a PTO connection for a hydraulic pump as standard. If other engine makes do not provide such a device, please consult VETUS.

\* In accordance with ISO 8665



This Sail Drive is available for all yellow VETUS marine diesel engines up to 80 hp. Two transmission ratios (2.49:1 or 2.23:1) have been selected to match engine power and speed to propeller size, with identical ratios both ahead and astern. This feature is ideal for twin-engine installations such as a catamaran, with one left-hand and one right-hand propeller. The overall dimensions are identical for both ratios. As an example, please see the installation drawing of engine model M4.17 below. Another advantage of this Sail Drive is that the underwater drive leg can be fitted 180° reversed. This will permit the engine to be installed ahead or behind the Sail Drive unit for greater flexibility of installation.

**WE WILL BE PLEASED TO RECOMMEND THE CORRECT PROPELLER FOR YOUR SAIL DRIVE**

Recommended transmission ratios:			
M2.C5	11 hp at 3000 r.p.m.	Ratio 2.23 : 1	
M2.D5	13 hp at 3000 r.p.m.	Ratio 2.23 : 1	
M2.06	16 hp at 3600 r.p.m.	Ratio 2.49 : 1	
M3.28	27.2 hp at 3600 r.p.m.	Ratio 2.23 : 1	
M4.15	33 hp at 3000 r.p.m.	Ratio 2.23 : 1	
M4.17	42 hp at 3000 r.p.m.	Ratio 2.23 : 1	
M4.55	52 hp at 3000 r.p.m.	Ratio 2.23 : 1	
VH4.65	65 hp at 3000 r.p.m.	Ratio 2.23 : 1	
VH4.80	80 hp at 4000 r.p.m.	Ratio 2.49 : 1	

**Technical data:**

Transmission ratio (ahead and astern) : 2.23 : 1  
Maximum input torque : 155 Nm

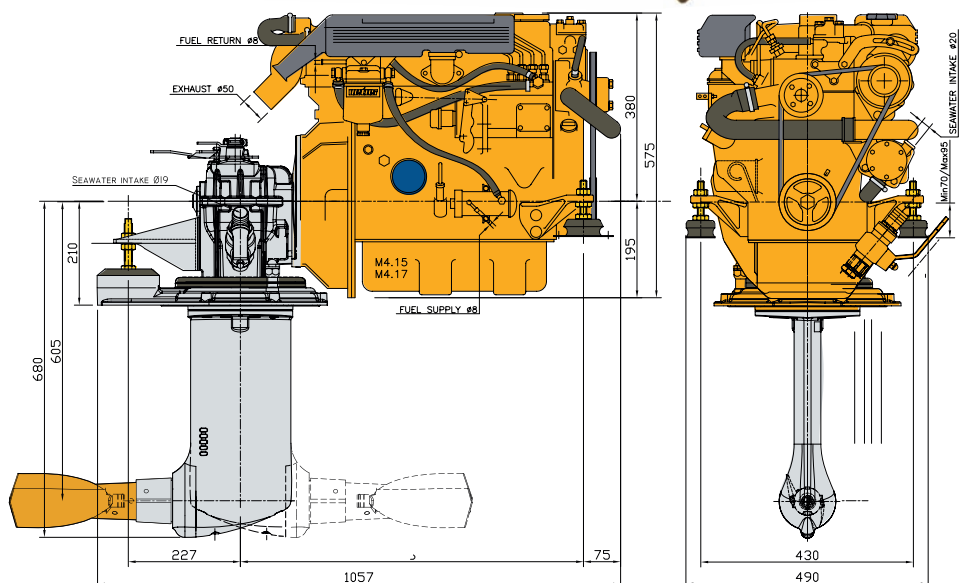
Transmission ratio (ahead and astern) : 2.49 : 1  
Maximum input torque : 147 Nm

Gear mechanism: protected against overload by incorporated torque limiter

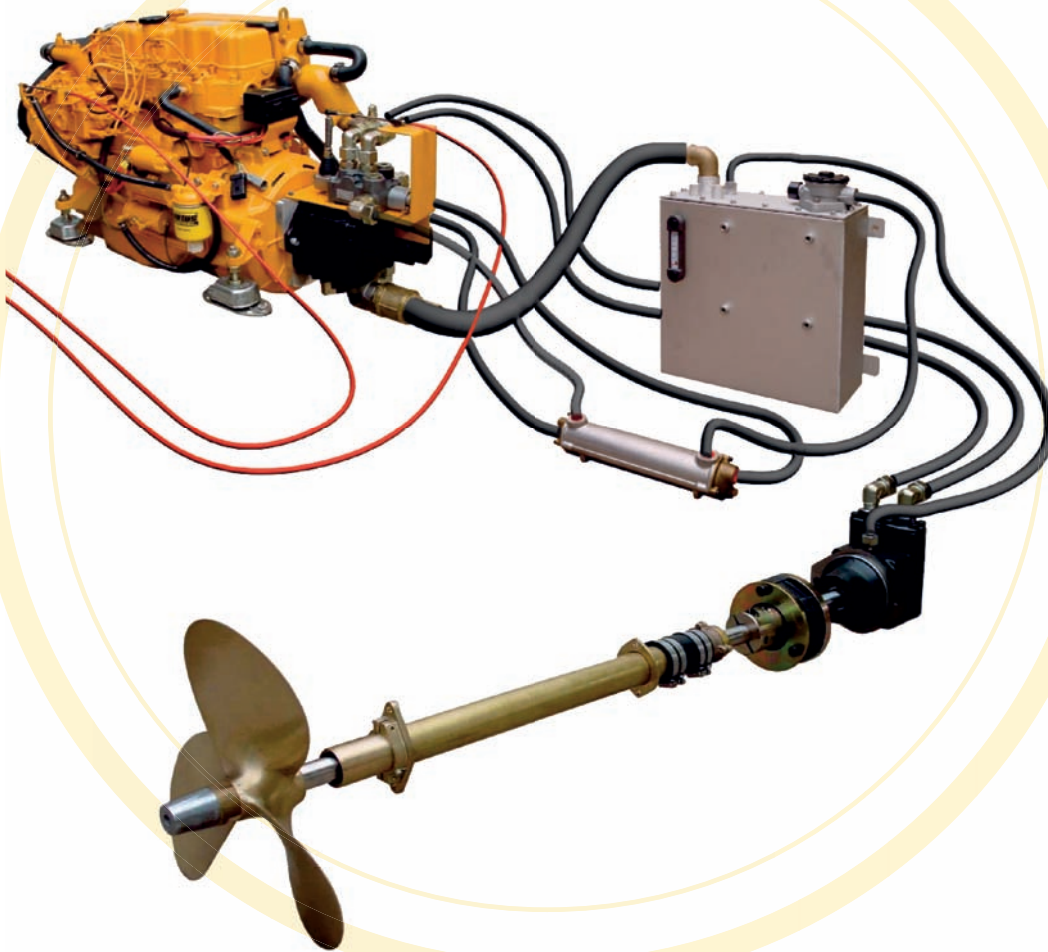
Weight : 30 kg

**OPTIONS:**

- Universal GRP engine bed, for models M2.C5, M2.D5, M2.06, M3.28, M4.15, M4.17 and M4.55.
- Universal GRP engine bed, for models VH4.65 and VH4.80.



In many cases it may be preferable to drive the propeller shaft by means of a **hydraulic motor**, instead of using the conventional set up of engine and gearbox. One of the major benefits of hydraulic propulsion is that the propulsion engine does not need to be installed in line with the propeller shaft. This means that the engine may be fitted in any suitable place on board, even athwartships. In addition, should the propeller become fouled or touch the bottom due to running aground, the risk of damage to the propeller shaft assembly, the hydraulic motor or the main engine is almost nil. An integrated pressure relief valve ensures that in the event of overloading, the hydraulic motor is safely bypassed. **Particularly in the case of hire craft, this is clearly a great advantage.** The hydraulic motor is engaged in a smooth and noiseless manner. The complete assembly is vibration free and the propeller thrust is not transmitted onto the engine, but onto the hydraulic motor instead, which is flexibly mounted on its own bed.



### HOW IT WORKS

A hydraulic vane pump is fitted to the engine in place of the gearbox. This pump draws hydraulic fluid from a storage tank and delivers it under pressure to the speed and direction control valve. The control valve determines the direction and volume of hydraulic flow to the hydraulic vane motor, which can then rotate clockwise or counter clockwise as selected. This hydraulic motor drives the propeller shaft via a flexible coupling. The VETUS system uses a hydraulic pump and motor with fixed swept volumes. The transmission ratios (reduction) in the propulsion system are achieved by the difference in volume between the vane pump and the hydraulic motor. The reduction between the engine RPM and the shaft RPM is 2:1 for models HPM4.15 and HPM4.17 and 1.9:1 for model HPH4.65. The maximum permissible engine power is 50 kW (67 HP), with a maximum engine speed of 3,000 RPM. In most cases a shaft diameter  $\varnothing$  25 mm will suffice. The output flange of the VETUS hydraulic motor fits all VETUS flexible couplings, as described on page 142 and 144.

One of the mechanical remote controls, shown on page 132. Will regulate shaft speed and direction of rotation.



VETUS hydraulic vane motor



Stainless steel storage tank



VETUS hydraulic vane pump



### SCOPE OF SUPPLY

VETUS hydraulic propulsion is available in 3 versions:

**MODEL HPM4.15**

has a VETUS M4.15 marine diesel engine of 24.3 kW (33 hp).

**MODEL HPM4.17**

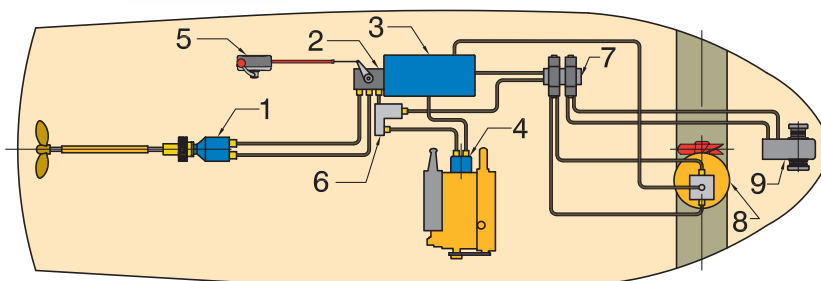
has a VETUS M4.17 marine diesel engine of 30.9 kW (42 hp).

**MODEL HPH4.65**

has a VETUS VH4.65 marine diesel engine of 48 kW (65 hp).

All versions include:

- Hydraulic vane pump
- Adapter flange and coupling to fit the pump to the relevant engine
- Hydraulic vane motor
- 35 litre hydraulic oil tank
- Oil cooler
- Control valve
- Flexible engine mounts
- Engine instrument panel and loom



1. Hydraulic vane motor
2. Mechanically operated control valve
3. Stainless steel storage tank
4. Hydraulic vane pump
5. Remote control handle with cable
6. Connection for ancillary devices
7. Control unit for ancillary devices
8. Bow thruster
9. Anchor windlass

## ELECTRIC PROPULSION (WITH BRUSHLESS ELECTRIC MOTOR)

The many virtues and pleasures of electric propulsion are well known in river and canal boating circles. Electric motors are virtually noiseless, have no smelly fuel and produce no polluting emissions. In other words, these propulsion units are truly "green" and environmentally friendly. By making good use of modern developments in electric motor design, VETUS has constructed the **ideal electric** propulsion unit. This has the principal assets of: **very low power consumption**, continuously variable speed, low weight and compact dimensions.



### THE VETUS BRUSHLESS ELECTRIC MOTOR

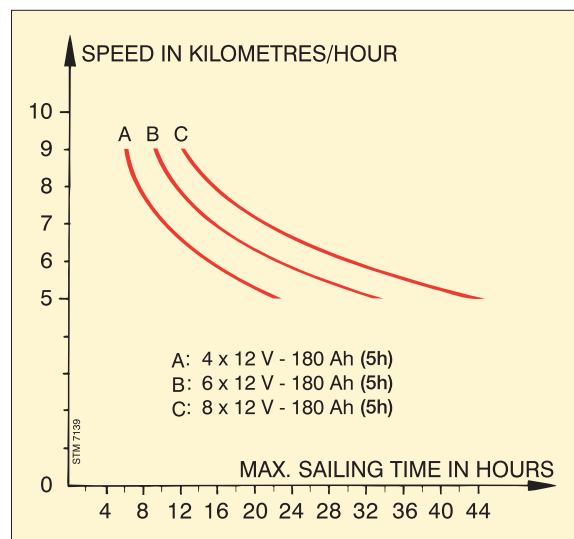
This VETUS electric propulsion motor does not use carbon brushes, which makes it whisper-silent and maintenance-free. At low revolutions, the efficiency of this brushless motor is considerably higher than conventional electric motors equipped with carbon brushes. This VETUS brushless motor also has a very favourable power to weight ratio. Another remarkable feature of the **brushless VETUS electric motor** is the very low number of revolutions (max. 1,250 r.p.m.), which means that it can be coupled directly to the propeller shaft, without the need for a reduction gearbox. The complete installation is maintenance free and operates virtually without vibration. Finally: the price is extremely competitive and much lower than that of a small diesel engine.

### KEEL COOLING

In order to enhance its efficiency even further, the electric motor is provided with a keel cooling system.

### IN PRACTICE

During trials with a 2,2 kW electric motor in a 6 metre GRP launch, with a total displacement of 1,2 tons (4 persons and 4 batteries on board), the power consumption was 50 A (24 Volt) and gave a max speed of 9 km/h. (4.8 knots) With the available battery capacity (24 Volt - 360 Ah (5h)) it was therefore possible **to make a trip of 6 hours at this maximum speed** assuming the batteries will accept 80% discharge. If lower speeds are acceptable, the total motoring time will of course be proportionally increased.



The diagram shows the motoring time (in this example) at various speeds and with different battery capacities.

### SCOPE OF SUPPLY

The standard motor package comprises:

- 2.2 kW electric motor with revolution regulator (continuously variable, reversible and water cooled).
- Electric remote control lever, with 5-metre connection cable.
- Four flexible motor mountings.
- Flexible coupling for connection to a  $\varnothing$  25 mm propeller shaft.
- Keel cooling
- **Weight:** 20 kg.

The following accessories must be ordered separately:

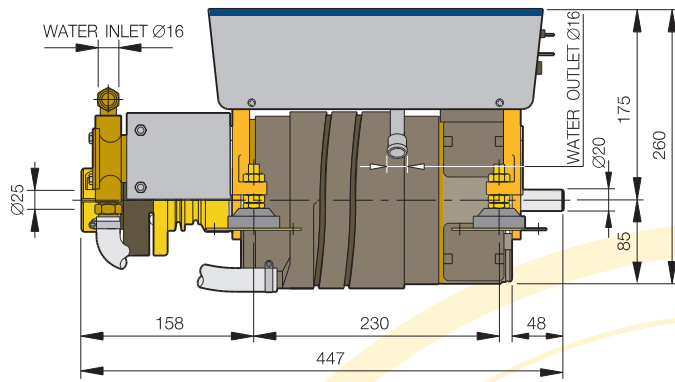
- Propeller shaft with bronze or g.r.p. stern tube (see page 156).
- Propeller (see page 154 and 155).
- Battery cables (see page 59).
- Batteries (see page 127).

Some more useful components that VETUS can supply:

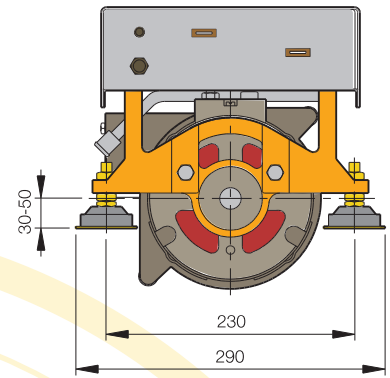
- Battery charger (see page 63).
- Battery selector switch (see page 59).
- Voltmeter (see page 127).



# ELECTRIC PROPULSION (WITH BRUSHLESS ELECTRIC MOTOR)

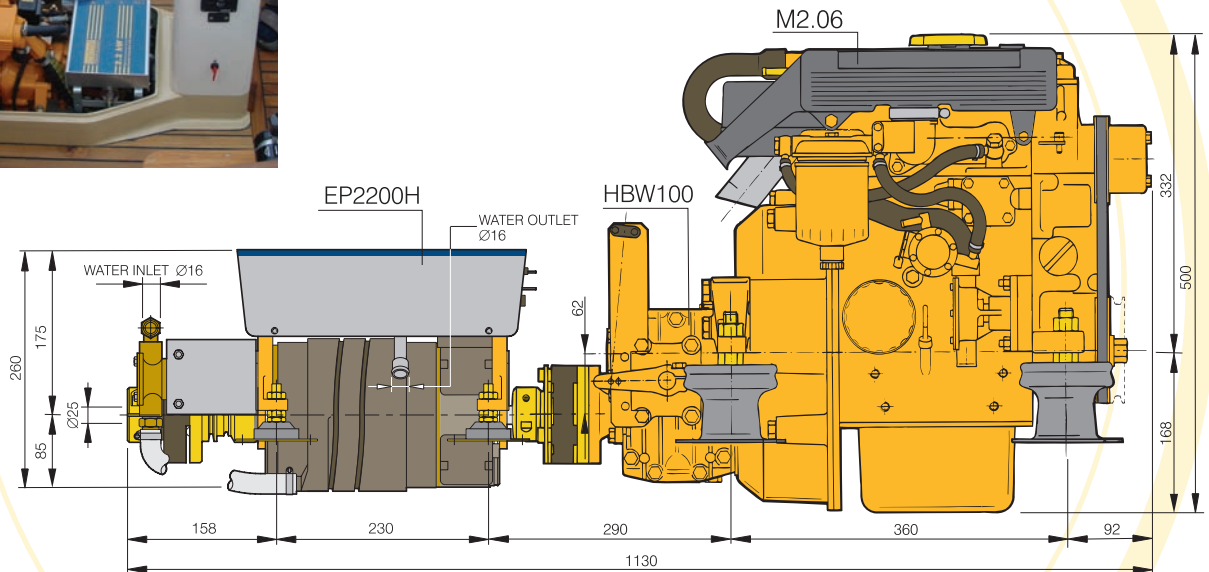


TYPE EP 2200 (2,2 KW)



## HYBRID INSTALLATION

A VETUS HYBRID INSTALLATION, ALLOWING EITHER ELECTRIC OR DIESEL PROPULSION.



A few hours of leisurely pottering around and then, at the end of the day, back home with a little more speed. The electric motor, driven by the diesel engine, will then function as a dynamo, charging the batteries for the next round of electric propulsion.

## SEMI-TRACTION BATTERIES

Because electric motoring often involves heavy discharge of the batteries, we recommend the use of semi-traction batteries. 12 Volt, 230 Ah (20h) - 180 Ah (5h). Dimensions: 518 x 276 x 242 mm (l x w x h) Weight: 62,3 kg. A battery with a nominal capacity of 230 Ah at 20 hours' discharge, will have a capacity of no more than 180 Ah in the case of a 5 hours' discharge.



## ENERGY CONSUMPTION GAUGE

It is often very important to know the exact state of charge of a battery or battery bank. Measuring only the voltage and current at a certain moment, by means of a voltmeter and ammeter respectively, does not provide sufficient information to ascertain the actual charge level. The VETUS energy consumption gauge continuously monitors the voltage and the charge or discharge current and can indicate from this information the level of battery charge. Furthermore, if the battery bank is being discharged, it will calculate the remaining time before complete discharge is achieved.

The energy consumption gauge monitors the following functions:

- Voltage; scale range 0-32.6 Volts. An alarm warns of low voltage during discharge or excessive voltage during charging.
- Charge or discharge current; scale range +/- 200 Amps.
- Battery state of charge; scale range 0-99.9% of the nominal battery capacity. This capacity can be entered by the user.
- Time to complete discharge at the present discharge rate; scale range 0-999 hours.

The instrument can be used in both 12 Volt and 24 Volt electrical systems. It is supplied with a 200 A shunt and both square and round bezels. Diameter of hole: Ø 52 mm. Outside dimensions: Ø 63 mm

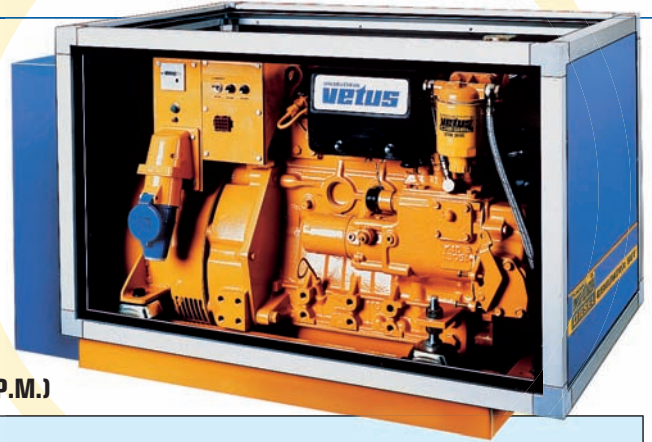






**4 - 24 KVA (3.000 R.P.M.)**

All VETUS generators are supplied as standard with both a complete exhaust system and water intake system.



**6.5 - 25 KVA (1.500 R.P.M.)**

**4 - 24 kVA generator sets 3.000 r.p.m. 50 Hz**

Model	Power kVA	Power (at cos φ = 0,8) kW	Voltage	Current Amps	Frequency Hz	Phase	Engine model VETUS	Generator- model	Weight without sound-proof-box	Weight with sound-proof-box
<b>GHS4:</b>	GHS4SI	4	3,2	230	14,7	50	1	F1.02	BWG430	95 kg
<b>GHS6.5:</b>	GHS6.5SI	6,25	5,2	230	22,5	50	1	M2.C5	BWG830	120 kg
<b>GHS8:</b>	GHS8SI	8	6,4	230	27,5	50	1	M2.06	BWG830	125 kg
<b>GHS14:</b>	GHS14SI	14	11	230	46	50	1	M3.09	BCI162G	220 kg
	GHS14TI	14	11	230/400	15,4	50	3	M3.09	BCI162E	200 kg
<b>GHS24:</b>	GHS24SI	24	19,2	230	85	50	1	M4.17	BCI182K	345 kg
	GHS24TI	24	19,2	230/400	28,5	50	3	M4.17	BCI162G	315 kg

**4,5 - 17 kVA generator sets 3.600 r.p.m. 60 Hz**

Model	Power kVA	Power (at cos φ = 0,8) kW	Voltage	Current Amps	Frequency Hz	Phase	Engine model VETUS	Generator- model	Weight without sound-proof-box	Weight with sound-proof-box
<b>GHS55IK</b>	GHS55IK	4,5	3,6	120/240	30/15	60	1	F1.02	BWG536	95 kg
<b>GHS75IK</b>	GHS75IK	7	5,6	120/240	47/23	60	1	M2.C5	BWG736	120 kg
<b>GHS95IK</b>	GHS95IK	9	7,2	120/240	60/30	60	1	M2.06	BWG936	125 kg
<b>GHS175IK</b>	GHS175IK	17	13,6	120/240	113/58	60	1	M3.09	BCI162G	220 kg
<b>GHS177IK</b>	GHS177IK	17	13,6	127/220 139/240 220/380 277/480	3 x 32 3 x 29 3 x 18 3 x 15	60	3	M3.09	BCI1162E	200 kg

**6,5 - 14 - 25 kVA generator sets 1.500 r.p.m. 50 Hz**

Model	Power kVA	Power (at cos φ = 0,8) kW	Voltage	Current Amps	Frequency Hz	Phase	Engine model VETUS	Generator- model	Weight without sound-proof-box	Weight with sound-proof-box
<b>GLS6.5:</b>	GLS6.5SI	6,5	5,2	230	22,5	50	1	M3.09	BWG615E	170 kg
<b>GLS14</b>	GLS14SI	14	11,2	230	48	50	1	M4.17	BCI184E	315 kg
	GLS14TI	14	11,2	230/400	16	50	3	M4.17	BCI164D	295 kg
<b>GLS25</b>	GLS25	25	20	230/400	36	50	3	VH4.80	BCI184F	415 kg

**7,8 - 30 kVA generator sets 1.800 r.p.m. 60 Hz**

Model	Power kVA	Power (at cos φ = 0,8) kW	Voltage	Current Amps	Frequency Hz	Phase	Engine model VETUS	Generator- model	Weight without sound-proof-box	Weight with sound-proof-box
<b>GLS7.55IK</b>	GLS7.55IK	7,8	6,2	120/240	52/26	60	1	M3.09	BWG164E	170 kg
<b>GLS175IK</b>	GLS175IK	17	13,6	120/240	114/57	60	1	M4.17	BCI184E	315 kg
<b>GLS177IK</b>	GLS177IK	17	13,6	127/220 139/240 220/380 277/480	3 x 36 3 x 33 3 x 21 3 x 17	60	3	M4.17	BCI164D	295 kg
<b>GLS30TIK</b>	GLS30TIK	30	24	127/220 139/240 220/380 277/480	3 x 63 3 x 57 3 x 36 3 x 29	60	3	VH480	BCI184F	415 kg

**Technical data generator: 4 - 8 kVA**

Voltage tolerance:  
plus or minus 5%  
Protection: IP55  
Overload capacity (2 sec.):  
3 x nominal current  
Max. ambient temperature: 40°C  
Max. raw water temperature: 30°C  
Noise level with sound-proof box:  
70 dB(A)  
Max.cont.angle of inclination:  
fore and aft: 15°  
athwartships: 25°

**Technical data generator: 14 - 24 kVA**

Voltage tolerance:  
plus or minus 2%  
Protection: IP55  
Overload capacity (2 sec.):  
2,5 x nominal current  
Max. ambient temperature: 40°C  
Max. raw water temperature: 30°C  
Noise level with sound-proof box:  
65 dB(A) / 68 dB(A)  
Max.cont.angle of inclination:  
fore and aft: 15°  
athwartships: 25°

**Technical data generators: 6,5 - 14 kVA**

Voltage tolerance:  
6,5 kVA plus or minus 5%,  
14 kVA plus or minus 2%  
Protection: IP55  
Overload capacity (2 sec.):  
3 x nominal current  
Max. ambient temperature: 40°C  
Max. raw water temperature: 30°C  
Noise level with sound-proof box: 57 dB(A)  
Max. cont.angle of inclination:  
fore and aft: 15°  
athwartships: 25°

**Technical data generators: 25 kVA**

Voltage tolerance:  
plus or minus 2%  
Protection: IP44  
Overload capacity (2 sec.):  
3 x nominal current  
Max. ambient temperature: 40°C  
Max. raw water temperature: 30°C  
Noise level with sound-proof box: 57 dB(A)  
Max. cont.angle of inclination:  
fore and aft: 15°  
athwartships: 25°

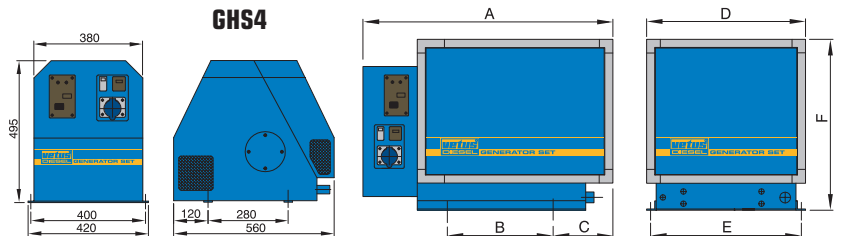


**REMOTE CONTROL PANEL  
GENERATOR SET (MPOOGEN)**

In addition to the standard remote control panel, any number of additional panels may be connected, as are required to start the generator set at any place on board.  
Dimensions: 94 x 94 mm.

	GHS6.2	GHS8	GLS6.2	GHS14	GLS14	GHS24	GLS25
A	780 mm	780 mm	920 mm	1010 mm	1120 mm	1180 mm	1360 mm
B	310 mm	310 mm	390 mm	390 mm	645 mm	665 mm	785 mm
C	180 mm	180 mm	220 mm	220 mm	130 mm	190 mm	150 mm
D	465 mm	465 mm	585 mm	585 mm	585 mm	585 mm	700 mm
E	435 mm	435 mm	555 mm	555 mm	555 mm	555 mm	670 mm
F	560 mm	560 mm	630 mm	630 mm	630 mm	630 mm	730 mm

Before selecting a generator set, please consult your dealer about its suitability to power existing or proposed electrical equipment on board.



## GENERATOR SETS WITH “POWER TAKE-OFF” (P.T.O.), TYPE SAE-B

Two generator sets fitted with a Power Take-Off (P.T.O.), type SAE-B flange, to take a hydraulic pump with a 13 spline shaft,  $1\frac{1}{32}$  pitch.

- TYPE GLS14:** suitable for a variable plunger pump with an output of 0 - 30 cm<sup>3</sup>
- TYPE GLS 25:** suitable for a variable plunger pump with an output of 0 - 30 cm<sup>3</sup> or 0 - 45 cm<sup>3</sup>



For this application a variable plunger pump with a compensated pressure/flow control and a limitable stroke volume should be used.

An electric generator set that is also fitted with a variable hydraulic plunger pump as shown here, is able to provide both hydraulic and electrical power and may therefore be genuinely called a multifunctional “powerpack”.

However, if the generator set is required to provide hydraulic power, under certain circumstances it may be that there is insufficient electrical power to meet demand, due to the limitations of the engine horsepower. In this case the electrical supply will be automatically locked out. Please see the relevant instruction manual. With a view to the fact that the pump stroke volume and operating pressure can be limited, the hydraulic output power may be limited to any maximum value, as required.

### A FEW EXAMPLES OF USEFUL APPLICATIONS:

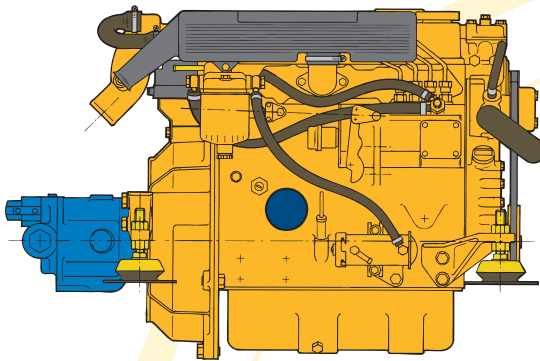
- When a boat has only one propulsion engine and it is required that the maximum output of both the bow thruster and the stern thruster is produced at idling speed. The generator set running at 1.500 rpm is about twice the speed of the propulsion engine at idling speed. This will then provide full power to both the bow and stern thrusters simultaneously.
- If a boat is equipped with a hydraulic emergency propulsion “HPS” installation (see page 27).

## POWERPACKS

### WHAT IS A “POWERPACK”?

The modern tendency is towards larger and larger boats that have requirements for more and more complex auxiliary power systems. The traditional approach has been to use electric power components, but these have disadvantages of cost, weight and size as the loads increase. There comes a point where a central hydraulic “Powerpack”, which is of more compact dimensions, becomes a most attractive alternative. The VETUS “Powerpack” consists of a marine diesel engine, fitted with a 30 cc hydraulic pump. This may then be used to power a variety of auxiliary installations on board.

**Note:** For details of the required hydraulic components, please see pages 25 and 26.



By having a hydraulic “Powerpack” on board, the electric generator set may be **much smaller than if all auxiliary functions** had been electric or electro-hydraulic. Therefore, the total cost of providing auxiliary power on board using a “Powerpack” is little different and with the added benefit of more security, flexibility and comfort!

### WHAT ARE THE ADVANTAGES OF A “POWERPACK”?

Conventionally, provision of auxiliary power applications on large vessels (such as windlasses, bow thrusters, furling systems etc.) has been by made using electric motors or hydraulics driven from the main engine or an electro-hydraulic pump. However, running a separate electric generator set, and/or a hydraulic pump driven by the main propulsion engine, has possible disadvantages, which may be avoided if a “Powerpack” is installed. In order to satisfy the energy requirements of an all electric boat, a generating set will have to run **almost permanently**, which means to say: **permanent noise** both on board and for the neighbouring vessels. Even if hydraulic systems are installed using a pump connected to the main propulsion engine, this may need to be started, just to provide a relatively small and short-term amount of power.

The answer is a “Powerpack”; a small diesel unit providing enough power to supply all hydraulic functions on board and easily started even for the quickest job. Apart from that, there will be only peace and quiet on board! It is also possible that the application of a “Powerpack” and hydraulic functions will permit the installation of a much smaller generator set than normal.

### A “POWERPACK” CAN BE USEFUL FOR DRIVING THE FOLLOWING EQUIPMENT:

- A hydraulic bow or stern thruster (see pages 22 and 23).
- A hydraulic anchor windlass (see pages 32 and 33).
- A “Get you home” emergency hydraulic drive system connected to the propeller shaft(s) in case of main engine failure (see page 27).
- Hydraulic power steering (see page 28).
- Air conditioning; direct drive, without the need for electricity.
- A variety of other hydraulic applications on board, such as: hatch lifters, furlers, passerelles, lifting cranes, stabilizers, etc.
- Hot water provision via a calorifier
- And many other possible applications.

**A VETUS “POWERPACK” CONSISTS OF A MARINE DIESEL ENGINE, TO WHICH A HYDRAULIC PUMP IS CONNECTED, INSTEAD OF THE USUAL GEARBOX. VETUS POWERPACKS ARE BUILT USING MITSUBISHI OR HYUNDAI ENGINES, WHICH COMBINE EXCELLENT POWER TO WEIGHT RATIOS WITH VERY COMPACT DIMENSIONS. BY VIRTUE OF THIS, A POWERPACK IS EASILY INSTALLED ON BOARD.**

### ACCESSORIES INCLUDED AS STANDARD

#### FOUR FLEXIBLE ENGINE MOUNTS



#### ENGINE START PANEL AND CABLE LOOM TYPE MP22

Optional additional panels for a second station are available (see pages 68 and 69).



### AVAILABLE AS AN OPTION

#### THROTTLE CONTROL LEVER

By controlling the RPM of the engine, the output of the attached hydraulic pump may be regulated. (see page 132).

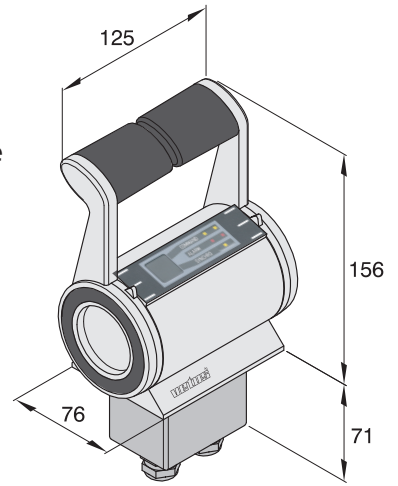


**REXROTH** is possibly the foremost German control manufacturer, renowned for the design and build of electronic remote controls for large commercial craft. It goes without saying that these are highly sophisticated and extremely reliable engine control systems. In close cooperation with Rexroth, VETUS now proudly introduces a version of these controls for pleasure craft and smaller commercial vessels.



The main advantages of this VETUS-REXROTH electronic remote control system are:

- Installation is simple and fast compared with mechanical systems.
- This system offers superior performance and fingertip control compared with conventional push-pull cables, especially where long cables and/or multiple control stations are fitted.
- Electric cabling is much easier to install than push-pull cables, as there are no limitations in length or bending radius.
- The inevitable lost movement and mechanical friction of push-pull cables is completely eliminated.
- The control levers are absolutely watertight and can be fitted externally.
- The control handles are available in the colours silver/grey or black.



The controls handles for one engine or for two engines are externally very similar in appearance.

## THE INDIVIDUAL COMPONENTS



**Single lever control handle for one engine (Throttle and gearshift) (1)**

**RECO1**



**Single lever control handle for two engines (Throttle and gearshift) (2)**

**RECO2**

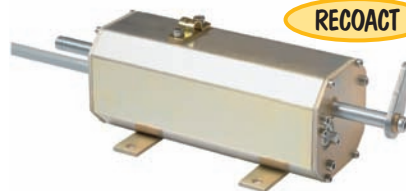


**Central control unit (3)**  
To be positioned inside the engine room, in the vicinity of the servo motors. The central control unit is designed to receive additional interface cards (5) and an autosynchroniser card (6).

**RECOBOX**

**Universal servo motor, for mechanically controlling either the throttle or the gearshift (4)**

Only applicable if the fuel injection pump and/or the gearbox are mechanically controlled by means of a short push-pull cable.



**RECOACT**

Where both functions are required then two motors must be installed. The servo motor(s) must be positioned as closely as possible to the propulsion engine.

**Interface card for electrical control of throttle and/or gearshift (5)**

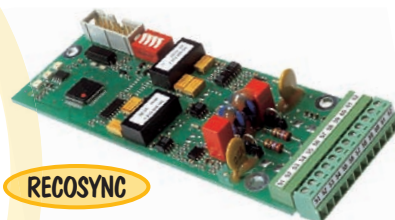
Only applicable if the fuel injection pump and/or gearbox are provided with electrical actuators. This interface card is fitted inside the central control unit (3). Only one interface card is required to control both the throttle and the gearshift.



**RECOPCB**

**Interface card for auto-synchronisation of two engines. (6)**

This optional p.c.b. is made available, so that the revolutions of two engines may be synchronised automatically, which will greatly reduce noise and vibration levels.



**RECOSYNC**

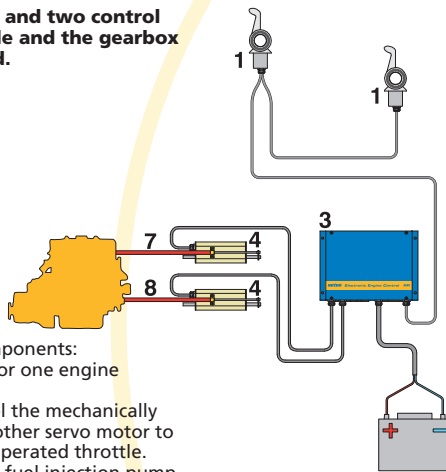
This interface card is fitted inside the central control unit (3). The automatic synchronous running is actuated very simply, by moving a control lever.

## ELECTRONIC ENGINE REMOTE CONTROL

**Installation of one engine and two control positions. Both the throttle and the gearbox are mechanically operated.**

The VETUS electronic engine control, according to the diagram above, consists of the following components:

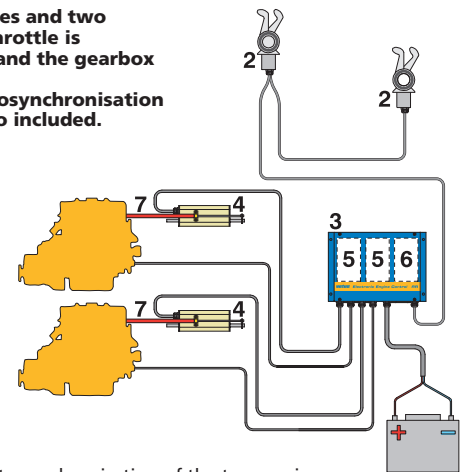
1. Two single lever controls for one engine
3. One central control unit
4. One servo motor to control the mechanically operated gearbox and another servo motor to control the mechanically operated throttle.
7. One push-pull cable to the fuel injection pump
8. One push-pull cable to the gearbox



**Installation of two engines and two steering positions. The throttle is mechanically controlled and the gearbox is electrically operated. An interface card for autosynchronisation of the two engines is also included.**

The VETUS electronic engine control, according to the diagram above, consists of the following components:

2. Two single lever controls or two engines
3. One central control unit
4. Two servo motors for the mechanically operated fuel injection pumps
5. Two interface cards for the electrically operated gearboxes
6. One interface card for auto-synchronisation of the two engines
7. Two push pull cables to the fuel injection pumps.



The VETUS electronic remote control is capable of controlling one or more engine(s) from one or several steering positions. Each control handle has a neutral button, which allows for starting and warming up the engine, whilst the gearbox is still in neutral. When more than one control station is installed, only one position can be operational at a time. A monitoring light shows which control is operational. Changing over from one control station to another is achieved by using a transfer switch. The electronic remote control is suitable both for mechanically and electrically operated throttles and gearshifts. Either 12 Volt or 24 Volt DC circuits can provide the power supply. So that

optimum matching with the engine and gearbox can be achieved the following settings may be programmed:

- Increased idling speed, prior to engaging the gearbox.
- A gearshift delay, allowing the engine time to reach the increased idling speed.
- A throttle delay after engaging gear (for slow changing hydraulic gearboxes).
- A time delay between shifting from forward to reverse (or vice versa).

## HYDRAULIC ENGINE REMOTE CONTROL

When there is a long distance between the engine and the steering position, conventional push-pull cables may cause unwanted operational tolerance ("slack"). VETUS hydraulic engine remote controls overcome this problem by providing precise control at any distance. In addition, this type of control is very reliable and the installation using micro-bore nylon or copper pipe is particularly easy.

### TWIN-CONTROL SYSTEM

Gearbox and throttle are operated separately. In other words: the gearbox and the fuel injection pump each have their own control units.

### SYNCHRONIZATION

Each control is provided with 4 small valves (2 in the hand control unit and 2 in the cylinder) which ensure that the handles at each steering position stay in corresponding positions.

### COUNTER-PRESSURE THROTTLE RETURN

The counter-pressure of the throttle return spring is compensated by an incorporated check valve.

### NEUTRAL CLUTCH DETENT

A special spring-loaded device provides a distinct "feel" when the gearbox is placed into neutral position.

### INSTALLATION

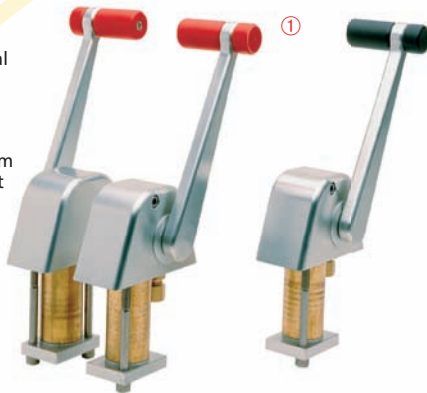
The connection between the control unit and the other components is made by application of VETUS nylon flexible hoses or of copper tubing. Diameter: 6 x 8 mm.

### HYDRAULIC FLUID

This fluid is of special composition, offering a low viscosity as well as a low expansion coefficient.

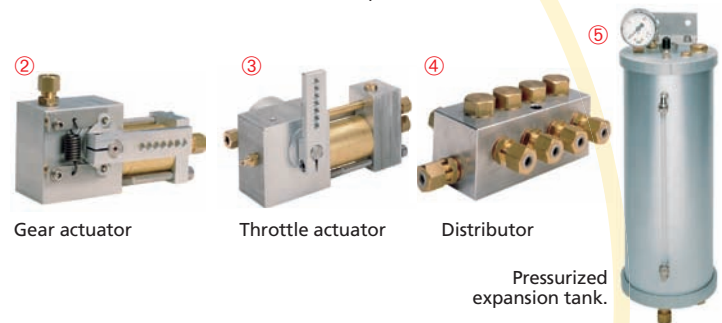
### SAFETY DEVICE

This safety device prevents the gearbox from being engaged when the engine is running above idling speed. To this effect, the cylinder for the fuel injection pump is provided with a mechanically operated interlock.

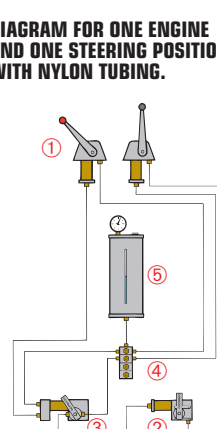


## THE VETUS HYDRAULIC ENGINE REMOTE CONTROL SYSTEM CONSISTS OF:

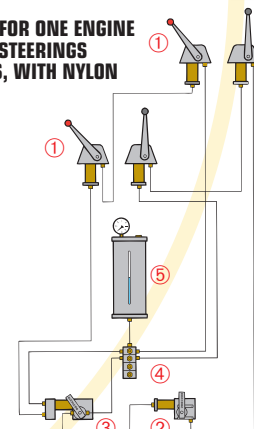
- 1) CONTROL UNIT: for one engine: one single lever control for throttle (red) and one for gearbox control (black). In the case of 2 or 3 steering positions, these units must be duplicated or triplicated respectively.
- 2) GEAR ACTUATOR: one for each hydraulic gearbox.
- 3) THROTTLE ACTUATOR: one for each fuel injection pump.
- 4) DISTRIBUTOR WITH EXPANSION VALVES: one per boat. In the case of twin engines and copper tubing: two per boat.
- 5) PRESSURIZED EXPANSION TANK: one per boat.



### DIAGRAM FOR ONE ENGINE AND ONE STEERING POSITION, WITH NYLON TUBING.



### DIAGRAM FOR ONE ENGINE AND TWO STEERING POSITIONS, WITH NYLON TUBING.

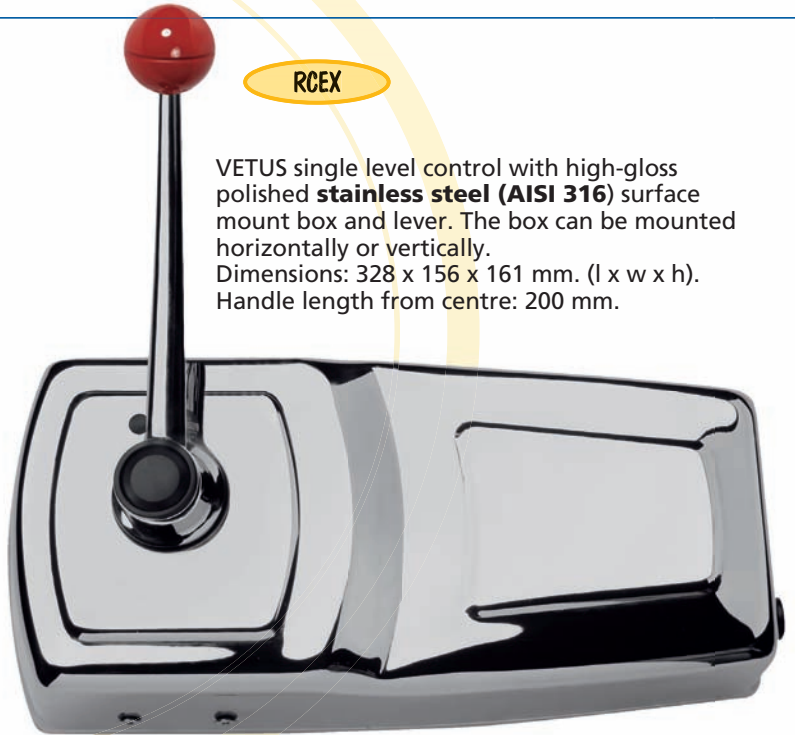




**SISCO**

**VETUS single lever remote control for side mounting, with stainless steel (AISI 316) handle and housing.**

The push-pull cables may be installed both horizontally and vertically.  
 Dimensions: 142 x 122 x 85 x 200 mm (l x w x h x handle length from centre).  
 Mechanism length: 243 mm from centre.



**RCEX**

**VETUS single level control with high-gloss polished stainless steel (AISI 316) surface mount box and lever. The box can be mounted horizontally or vertically. Dimensions: 328 x 156 x 161 mm. (l x w x h). Handle length from centre: 200 mm.**

All stainless steel handles are provided with a red knob. A black knob is available as an extra; please see the price list.

**Top-mounting**

**VETUS single lever remote control for top mounting. The housing and the handle are made of high-gloss polished stainless steel (AISI 316).**

Dimensions: 162 x 104 x 237 mm. (l x w x h) incl. handle  
 Mechanism depth: 208 mm.



**RCTOPS**

**Top-mounting for 2 engines**

**VETUS single lever remote control for top mounting. The housing and the handles are made of high-gloss polished stainless steel (AISI 316).**

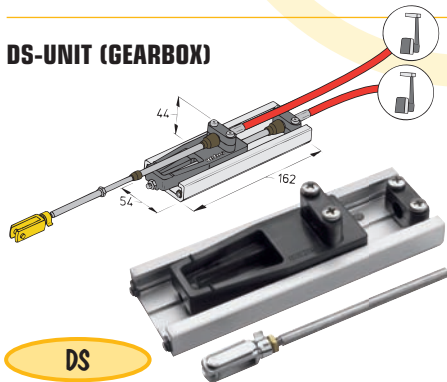
Dimensions: 162 x 200 x 237 mm. (l x w x h) incl. handle  
 Mechanism depth: 208 mm.



**RCTOPTS**

All remote controls shown above, have as standard, a neutral safety switch, which prevents the engine from being started whilst the gearbox is engaged.

**DS-UNIT (GEARBOX)**



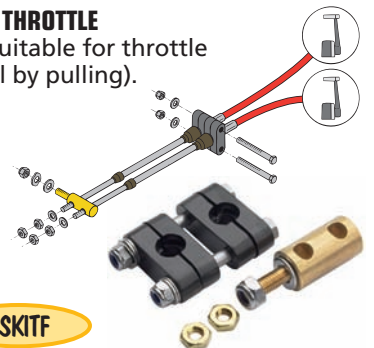
**DS**

**DUAL STATION UNITS TYPE DS**

These units combine the action of the single lever control from either of two command stations and provide a single output to the engine throttle lever or the gearbox lever.  
 Per engine two dual station units are needed, one for the gearbox (type DS-UNIT) and one for throttle (type DS-KITF).

**DS-KIT THROTTLE**

(only suitable for throttle control by pulling).



**DSKITF**

# MECHANICAL ENGINE REMOTE CONTROL

## VETUS single lever remote control for side-mounting with stainless steel (AISI 316) handle and plastic housing.

The push-pull cables may be installed both horizontally and vertically.

Dimensions:  
147 x 127 x 85 x 200 mm  
(l x w x h x handle length from centre).

Mechanism length: 243 mm from centre.



SICO

## Top-mounting

With cast aluminium housings and stainless steel (AISI 316) handle.

Dimensions:  
162 x 104 x 237 mm  
(l x w x h)  
Mechanism depth 208 mm.



RCTOPB

## Top-mounting for 2 engines

With cast aluminium housings and stainless steel (AISI 316) handles.

Dimensions:  
162 x 200 x 237 mm  
(l x w x h)  
Mechanism depth 208 mm.



RCTOPTB

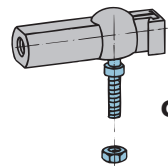
All remote controls shown above, have as standard, a neutral safety switch, which prevents the engine from being started whilst the gearbox is engaged.

## SHUT-OFF CONTROL TYPE DC

To be used with our VETUS push-pull cables.

DC

- Corrosion free.
- 30° mounting bracket.
- Easy installation both horizontally and vertically.



Cable clamp

Ball-joint

As an extra we can supply ball joints and cable clamps for our VETUS push-pull cables.

## BLACK/SILVER PLASTIC HOUSINGS WITH BLACK METAL AND PLASTIC LEVERS. (without neutral safety switch)



AFSTZJ

Side-mounting



AFSTTOP

Top-mounting



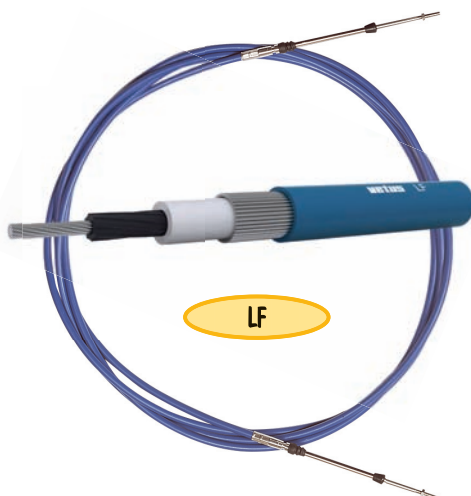
AFSTTOPT

Top mounting for 2 engines

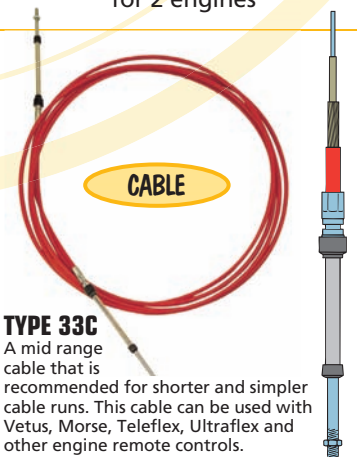
## PUSH-PULL CABLES TYPE LF "LOW FRICTION"

This high quality cable utilises a multi-strand wire core for superb strength and flexibility. The core is provided with a ribbed synthetic sheath, ensuring that contact with the outer casing is kept to a minimum. Therefore, LF type cables are ideal for long and complicated runs and for dual station installations. This cable can be used with Vetus, Morse, Teleflex, Ultraflex and other engine remote controls.

- Lengths from 0.5 to 10 metres in half metre steps.
- Lengths up to 17 metres available to special order
- Nominal travel: 75 mm.
- Minimum bend radius: 165 mm
- Standard rod 10-32 UNF threaded ends



LF



CABLE

## TYPE 33C

A mid range cable that is recommended for shorter and simpler cable runs. This cable can be used with Vetus, Morse, Teleflex, Ultraflex and other engine remote controls.

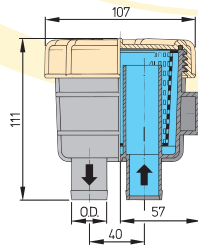
- Lengths from 0.5 to 10 metres in half metre steps.
- Lengths up to 15 metres available to special order
- Nominal travel: 75 mm.
- Minimum bend radius: 130 mm
- Standard rod 10-32 UNF threaded ends

All VETUS cooling water strainers are provided with a **transparent** cover, allowing easy inspection of the filter without dismantling. Cleaning of the filter can be achieved quickly and easily. Due to the large active surface however, the filter seldom needs to be cleaned.



internal hose Ø		max. capacity l/min.	recommended input l/min
mm	inches		
12,7	1/2	50	23
15,9	5/8	80	35
19,1	3/4	120	51

**FTR140**



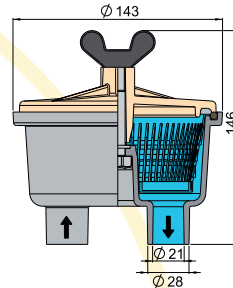
This water strainer is available with **three** different hose connections.

- Materials:
- Housing = Polypropylene GF
  - Filterelement = HD Polyethylene
  - Cover = Styrol/Acrylnitril SAN

**ALSO IDEALLY SUITED FOR USE WITH SHOWER DRAIN PUMPS**

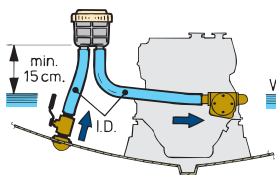
internal hose Ø		max. capacity l/min.	recommended input l/min
mm	inches		
28,5	1 1/8	262	114

**FILTER150**

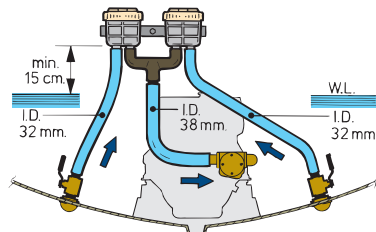


This water strainer is suitable for only one hose diameter.

- Materials:
- Housing = Polypropylene GF
  - Filter element = Polyamide
  - Cover = Polycarbonate

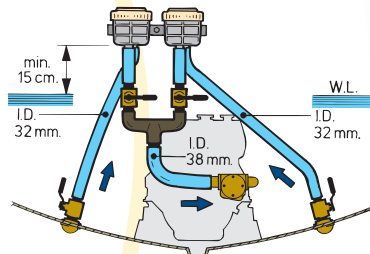


**STANDARD FORMATION**



**PARALLEL FORMATION I**

By connecting water strainers type 330/32 in this way, a total capacity of 460 litres per minute is achieved.



**PARALLEL FORMATION II**

By connecting water strainers type 330/32 in this way, a total capacity of 460 l/min is achieved. Moreover, each filter can be cleaned separately with the engine running.



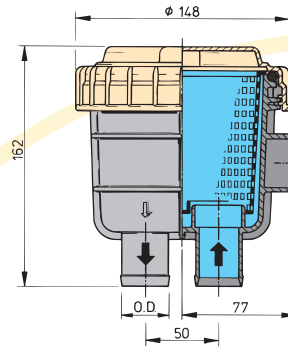
**CONN330**

With these connection parts 2 water strainers 330/32 can be interconnected. See pricelist.

This water strainer is available with **six** different hose connections.

Materials:  
 Housing = Polypropylene GF  
 Filterelement = HD Polyethylene  
 Cover = Styrol/Acrylnitril SAN

**FTR330**

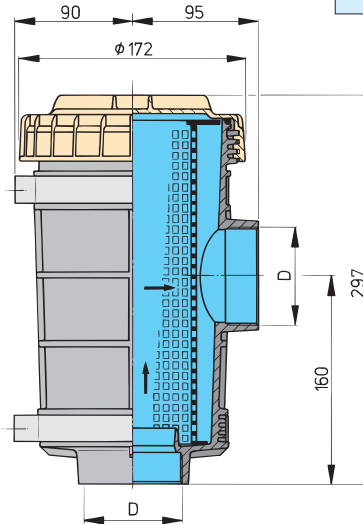


internal hose Ø		max. capacity l/min.	recommended input l/min.
mm	inches		
12,7	1/2	50	23
15,9	5/8	80	35
19,1	3/4	120	51
25,4	1	210	91
31,8	1 1/4	330	143
38,1	1 1/2	470	200

Available with 3 different threaded connection diameters. The water strainer type 1320 is provided with adjustable brackets for bulkhead mounting.

Materials:  
 Housing = Polypropylene GF  
 Filter element = Polypropylene  
 Cover = A.B.S.

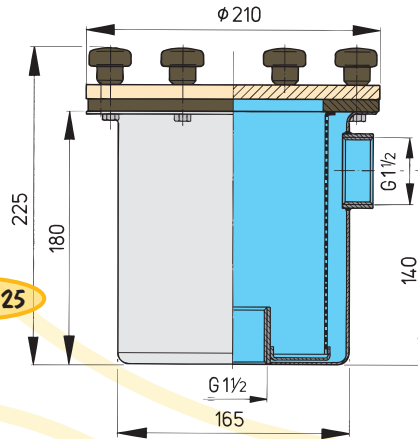
**FTR1320**



D	hose inside Ø		max capacity l/min.	recommended input l/min.
	mm	inches		
G 1 1/2	38	1 1/2"	520	205
G 2	50	2"	850	365
G 2 1/2	63	2 1/2"	1320	570

Available with G 1 1/2 threaded connections: stainless steel housing and filter element. A set of mounting brackets (not shown) can be supplied as an option. Please see pricelist.

**FILTER525**

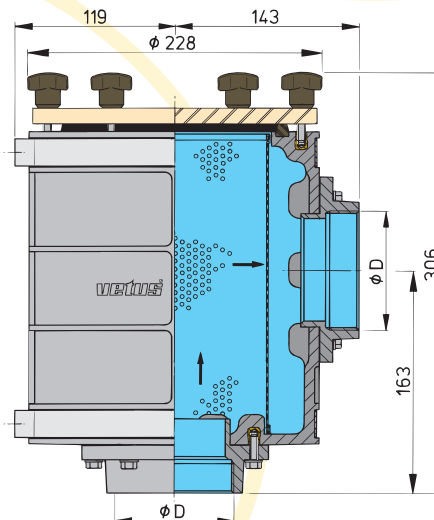


D	hose inside Ø		max capacity l/min.	recommended input l/min.
	mm	inches		
G 1 1/2	38	1 1/2"	525	205

Available with 2 different threaded connection diameters. Filter 1900 comes complete with adjustable mounting brackets for bulkhead installation.

Materials:  
 Housing = polyethylene.  
 Filter element = stainless steel.  
 Cover = acrylic.

**FTR1900**



D	hose inside Ø		max capacity l/min.	recommended input l/min.
	mm	inches		
G 2 1/2	63	2 1/2"	1320	570
G 3	76	3"	1900	820

For matching accessories see page 90 and 91.  
 For hoses see page 88 and 89.



## ESPECIALLY DEVELOPED FOR MARINE USE

Many people are totally unaware of the problems that water in fuel can cause. Droplets of water in fuel are the ideal carriers of dirt and rust through narrow pipes. One small drop of water may cause blockage of the fuel pump, cutting off the fuel supply. With diesel engines it is then very difficult to re-start the engine. Water may also be the cause of rust in the pump or in the injectors, resulting in blockage and expensive repairs. Fuel tanks in boats often contain some water, which seeps in when filling, or which is formed by condensation. Apart from this, a fuel tank in a boat often contains dirt, which is too much for just the primary fuel filter of the engine to handle. A VETUS separator/fuel filter is therefore certainly no luxury, but a necessity.

### VETUS water separators/fuel filters consist of the following components:

1. a water separator which, owing to the fact that water is heavier than fuel, allows the water and the heavier dirt particles to settle. The bowl receiving the separated water and dirt is very large, so that, generally speaking, it will not be necessary to drain more than once a month, through the plug or tap at the bottom of the housing.
2. a fuel filter which stops the remaining solid dirt particles, at the same time removing the residue of water from the fuel.

VETUS water separators/fuel filters are made for simple and easy installation. Changing of the filter elements is also a matter of seconds only. The maximum water separation is more than 90%. Together with the application of the primary fuel filter, fitted to the engine, a total water separation of 99% is achieved.

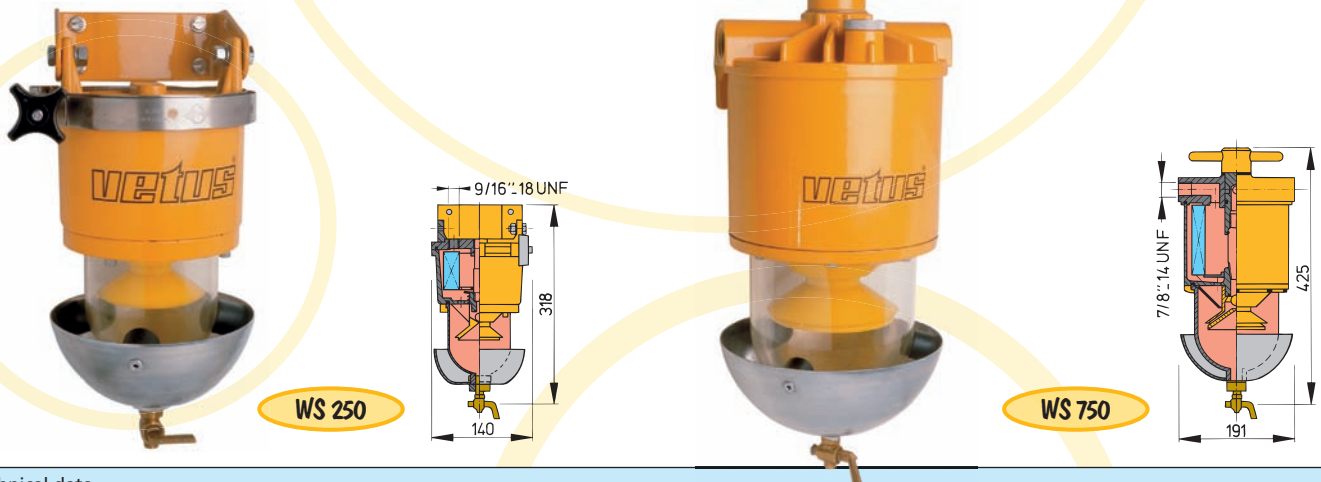
**VETUS water separator/fuel filters must be installed vertically and as close to the tanks as possible.**



Technical data										
Model	Maximum capacity	Recommended capacity	Connections	Connector nipples	Weight	Contents of receiver bowl	Heat deflection shield	Suitable for diesel engines	Suitable for petrol engines	Replace filter elements
	l/hour	l/hour	Female thread	Round	kg	cm <sup>3</sup>				Number of service hours**
WS180	180	110	M14 x 1,5 mm	8 mm	0,7	170	X	✓	✓	200
WS720	720	440/640*	M18 x 1,5 mm	15 mm	1,5	170	X	✓	✓	200

\* With rotary fuel injection pump (as is the case with VETUS DEUTZ engines)

\*\* In any case: replace filter elements once a year



Technical data										
Model	Maximum capacity	Recommended capacity	Connections	Connector nipples	Weight	Contents of receiver bowl	Heat deflection shield	Suitable for diesel engines	Suitable for petrol engines	Replace filter elements
	l/hour	l/hour	Female thread	Round	kg	cm <sup>3</sup>				Number of service hours**
WS250	250	150	9/16" - 18 UNF	10 mm (3/8")	2,27	270	✓	✓	X	500
WS750	750	450/640*	7/8" - 14 UNF	15 mm (5/8")	5,4	800	✓	✓	X	1000

\* With rotary fuel injection pump (as is the case with VETUS DEUTZ engines)

\*\* In any case: replace filter elements once a year

After your house, your boat is probably the most expensive asset that you own. Often left unattended for lengthy periods of time, there is an increasing risk that not only will it be broken into and valuable equipment stolen, but the boat itself may be stolen altogether. With the VETUS Security System these worries may be a thing of the past. Not only will it monitor and report unauthorised entry or removal of your boat, but it can also be customised to report high bilge water level, smoke or low battery state among other things. In the case of theft, the system will send a message with the current GPS location of the boat, as well as the speed and the direction in which it is moving (Track and Trace). The message and the follow-up can be monitored via your mobile phone or via an alarm station, with coverage throughout Europe. You can even track the movements of your boat via the internet.



### BOAT DETECTION SYSTEM (BDS) (NL/EU)

The basic system consists of a smart box with a GSM/GPS module inside. You will need to subscribe to a SIM card, which is fitted in the basic module. Using a simple plug and play cable arrangement, the boat is fitted with a motion detector (PIR /RADAR) in the cabin and/or a light beam sensor in the cockpit. In the event of theft or unauthorised entry, the system will immediately transmit a SMS message. You are then able to monitor the actual status of your boat by SMS message or via an internet subscription.

#### Standard system consists of:

- BDS basic module with incorporated GPS aerial
- Siren
- GPS Track and Trace
- Battery voltage watch
- Remote control (2 hand-held transmitters)

#### Optional:

- Movement detector type PIR/RADAR for bulkhead or ceiling mounting.
- Movement detector (light beam sensor) for the cockpit.



### BOAT MONITORING SYSTEM (BMS) (NL/EU)

The boat monitoring system consists of the same smart box with GSM/GPS module plus a splitter module. All peripherals, such as an alarm, motion detectors, high bilge water sensors, smoke detectors, battery watch, temperature sensors and even switches to control the refrigerator or the heating system are available as options. These are connected to simple and clearly marked terminals on the splitter module.

With this choice of components, you will be able to customise the system entirely to your requirements and to add further sensors in the future.

A simple and intuitive control panel with display allows you to activate all settings and select the types of alarm.

The SIM card will transmit a SMS message in the case of an alarm. You can also check on the status of your boat by SMS message or via an internet subscription.



Both systems function from 12 or 24 Volt DC supplies. They are completely watertight and in stand-by position the battery drain is minimal. Should the power supply be disconnected, an internal battery will ensure that the system remains active for up to 24 hours. Both systems are supplied with a SIM card for use within The Netherlands \* and an EU version which is accessible throughout Europe.

\* Systems for use in The Netherlands also offer follow-up throughout Europe in the case of theft of the complete boat.

#### Standard system consists of:

- BMS module with status display, keyboard and separate splitter module

#### Optional:

- Remote control with 2 hand-held transmitters
- Smoke detector
- Bilge water level sensor
- Movement detector type PIR/RADAR **for enclosed spaces**
- Movement detector (light beam sensor) **for open spaces**
- Acoustic alarm
- Engine immobiliser
- Shore supply detector
- Siren
- GPS aerial
- External GPS/GSM aerial
- Relays for remote operation of heating, refrigerator, etc.
- Iridium modem (offers world-wide coverage, independent from GSM network)

**Installation of a security system on your boat may reduce your insurance premium. Check with your insurance company!**

#### SIM-CARD

For use in The Netherlands or with Europe-wide coverage.

#### ALARM STATION

This station ensures professional worldwide follow-up in the case of unauthorised entry or theft of the boat. The moment a report comes in, the location of your boat is precisely known and action will be taken to retrieve your vessel as soon as possible.

#### INTERNET FOLLOW-UP SYSTEM

Specially developed for monitoring one or more boats via personal access to the internet. You will receive a tracking record by means of Google maps and all settings and types of alarm are displayed.

## LOUVRED AIR SUCTION VENTS

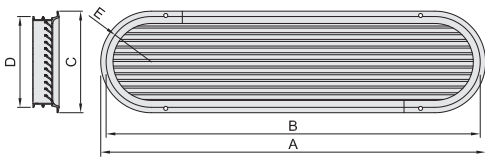
A marine diesel engine needs sufficient air in order to function correctly. The volume of combustion air required is approximately 6.1m<sup>3</sup> per kW (4.5 m<sup>3</sup> per hp) per hour, based on a maximum air velocity of 3m/sec. In addition to combustion air, the engine also requires sufficient ventilation air to dissipate the radiated heat. The volume of ventilation air required is about the same as the combustion air needed. The design of the VETUS air suction vents is based on these principles. The model numbers given in the

### THE FRAME IS MADE OF POLISHED ANODISED ALUMINIUM AND THE GRILLES OF NATURALLY ANODISED ALUMINIUM



#### ASV

Air Suction Vent ASV	20	25	30	40	50	60	70	80	90	100	125	150
Dimensions in mm												
A	300	350	360	450	490	570	590	660	670	730	750	890
B = Cutout	280	330	340	430	470	550	570	640	650	710	730	870
C	117	117	130	130	146	146	159	159	172	172	198	198
D = Cutout	97	97	110	110	126	126	139	139	152	152	178	178
E = Cutout radius	R 48,5	R 48,5	R 55	R 55	R 63	R 63	R 69,5	R 69,5	R 76	R 76	R 89	R 89
Free flow area in dm <sup>2</sup>	0,83	1,00	1,22	1,59	2,02	2,41	2,83	3,21	3,63	4,00	5,03	6,08

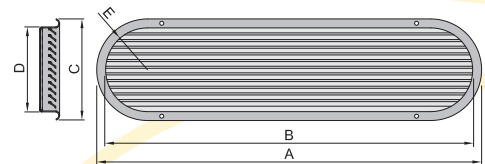


### THE FRAME IS MADE OF HIGH GLOSS STAINLESS STEEL (AISI 316) AND THE GRILLES OF NATURALLY ANODISED ALUMINIUM



#### SSV

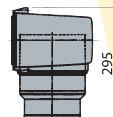
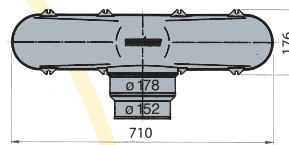
Air Suction Vent SSV	70	80	90	100	125	150
Dimensions in mm						
A	590	660	670	730	750	890
B = Cutout	570	640	650	710	730	870
C	159	159	172	172	198	198
D = Cutout	139	139	152	152	178	178
E = Cutout radius	R 69,5	R 69,5	R 76	R 76	R 89	R 89
Free flow area in dm <sup>2</sup>	2,83	3,21	3,63	4,00	5,03	6,08



### LOUVRED AIR VENT WITH HOSE CONNECTOR Ø 152 MM AND Ø 178 MM

#### MOF100

The VETUS extraction ventilator type VENT178 can easily be connected to the louvred air vent MOF100, by means of flexible air hose with 178 mm internal diameter.



This ventilation box with hose connections fits to the aluminium louvred air vent type ASV100, which should be ordered separately. It cannot be used with the stainless steel version, type SSV.



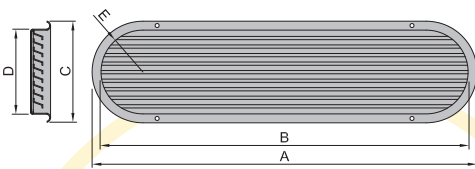
**SUCTION/PRESSURE HOSE**  
 ø 152 mm or ø 178 mm.  
 Very flexible hose, to connect the MOFI air vent to the extraction ventilator, type 178.

table relate to the engine horsepower for which they are suitable. When designing the engine room layout, it is therefore easy to calculate the size of the air vents required. Do not forget to allow for extra vents to extract the heat from the engine space as well. **For example:** A boat with an engine of 60 hp will require for the combustion and ventilation air, 2 louvred air suction vents type 60 (1 x Starboard + 1 x Port) or 4 type 30 vents (2 x Starboard + 2 x Port).

## THE FRAME AND GRILLES ARE MADE OF HIGH GLOSS POLISHED STAINLESS STEEL (AISI 316)



**SSVL**



Air Suction Vent SSVL	70	80	90	100	125	150
Dimensions in mm						
A	590	660	670	730	750	890
B = Cutout	570	640	650	710	730	870
C	159	159	172	172	198	198
D = Cutout	139	139	152	152	178	178
E = Cutout radius	R 69,5	R 69,5	R 76	R 76	R 89	R 89
Free flow area in dm <sup>2</sup>	2,83	3,21	3,63	4,00	5,03	6,08

## ALL STANDARD AIR SUCTION VENTS CAN BE SUPPLIED WITH A SYNTHETIC DORADE BOX AS AN OPTION



**DBOX**



## ROUND AIR SUCTION VENT

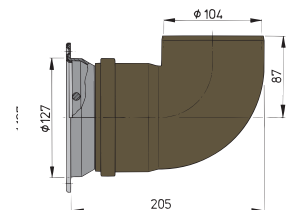
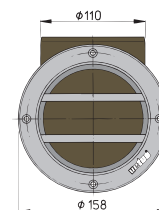
This air suction vent is made of stainless steel. The synthetic rotating hose connector acts as a watertight dorade box. This vent is suitable for 16 hp of engine power.

Therefore, for a 60 hp engine, 4 of these air suction vents must be fitted (2 x to port and 2 x to starboard).



\* free flow area: 0,66 dm<sup>2</sup>

**ERV110**



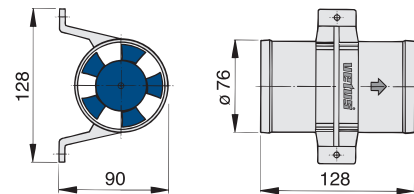
## EXTRACTION VENTILATOR FOR ENGINE ROOMS



**TWINLINE**

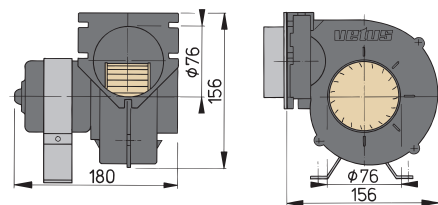
For installation into blower hose with an internal diameter of 76 mm.

- **Ignition protected**
- Complies with ISO 9097 Marine Standard.
- Capacity 4 m<sup>3</sup> per minute.
- Static pressure: 36 mm H<sub>2</sub>O.
- Available in 12 V - 2,8 A max.
- Suited to fit Ø 76 mm I.D. hose (see page 88).
- Hose may be connected to Scirocco or Typhoon Shell ventilators (see page 97).



**VENT76**

- **Ignition protected.**
- Complies with ISO 9097 Marine Standard
- With Delrin Impeller.
- Capacity 4 m<sup>3</sup> (140 cu.ft.) per minute.
- Static pressure: 57 mm H<sub>2</sub>O
- Ideal for galley, toilet and engine room.
- Available in 12 or 24 Volt.
- Connection for 76 mm I.D. hose (see page 88)
- 12 Volt-8 A/24 Volt-4 A



**HOSE CONNECTION WITH MOUNTING BRACKET**  
(for optional in-line outting).



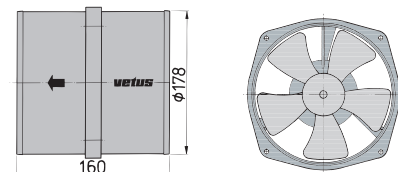
**VENTKIT**

We do **not** approve of using these extraction ventilators to provide air to the main engine(s). Every marine engine is able to draw sufficient air by itself, provided of course, that the ventilation openings to the engine room are adequate. If such an extraction ventilator is placed in the air duct to a marine engine, the electric motor may even overheat, as the suction power of the engine will cause the fan to run in excess of the number of revolutions it is designed for. The purpose of these VETUS ventilators, for which they are ideally suited, is to extract the heat from the engine room when the engines are stopped, or, when petrol engines are installed, to extract any possible petrol vapours prior to starting the engine(s).



**VENT178**

- **Ignition protected**
- Complies with ISO 9097 Marine Standard.
- Available for 12 Volt (8 A) or 24 Volt (4 A) installations
- Capacity: air displacement of approx. 12,2 m<sup>3</sup> per minute at 12 Volt D.C.
- Static pressure: 32 mm H<sub>2</sub>O.
- Air displacement of approx. 12,5 m<sup>3</sup> per minute at 24 Volt D.C.
- Static pressure: 36 mm H<sub>2</sub>O
- Suitable for bulkhead mounting and for receiving Ø 178 mm (internal) air ducting hose (see page 138).



## ALL VETUS ENGINE MOUNTINGS ABSORB THE PROPELLER THRUST

The torque of an engine is one of the deciding factors for determination of the load applied to the engine mounts. When more powerful engines are installed, it is important to use the following formula to define the load per support in kg (4 supporting points).

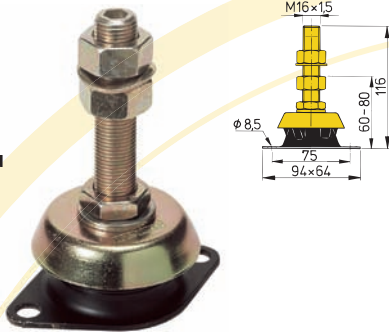
$$\frac{\text{engine weight in kg}}{\text{number of supports}} + \frac{\text{kW} \times 487 \times \text{reduction of gearbox engine revs/min.} \times \text{centre to centre spacing in metres of the longitudinal engine bearers}}{\text{support in kg}} = \text{max. load per support in kg}$$

These engine mountings are standard supply with the VETUS marine diesel engines M 2.C5 (see page 110) and M 2.D5 (see page 111)

**These flexible engine mountings are suitable for marine diesel engines in the power range between 4 KW and 15 KW (6 HP - 20 HP).**

### TYPE K 25

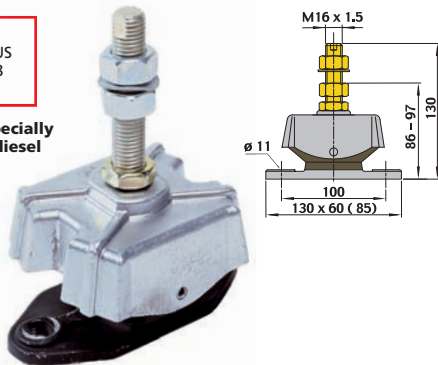
Application: small engines and generator sets with 1 or 2 cylinders. This flexible mounting contains a special rubber compound with excellent vibration damping properties.



Type	Stiffness ratio			Min. load kg	Min. compression mm	Max. load kg	Max. compression mm	Hardness in ° Shore
	vertical	athwart-ships	fore and aft					
K25	1	1,4	1,4	15	1,3	35	3	45

These flexible engine mountings are standard supply with the VETUS marine diesel engine model M3.28 (see page 113).

**These engine mountings are especially designed for 3-cylinder marine diesel engines.**

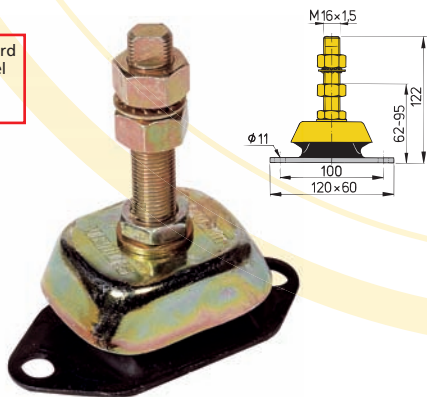


### TYPE K 40

The relatively soft rubber compound of these flexible mountings fulfils precisely the requirements of light-weight vessels, equipped with a modern 3-cylinder marine diesel engine, with regard to the insulation of vibrations. The rubber elements are especially shaped to create the optimum in vibration dampening. The VETUS flexible engine mounting type K40 features internal buffers, which limit the engine movement when started or stopped and it is also secured against overload and shearing off.

Type	Stiffness ratio			Min. load kg	Min. compression mm	Max. load kg	Max. compression mm	Hardness in ° Shore
	vertical	athwart-ships	fore and aft					
K40	1	1	2,4	25	5	40	8	50

These engine mountings are standard supply with the VETUS marine diesel engines M 4.15 (see page 114) and M 4.17 (see page 115).



### TYPE K

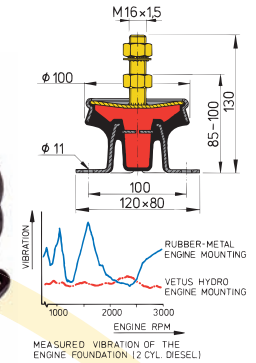
**For smaller engines, up to appr. 60 kW (80 HP).**

Type	Stiffness ratio			Min. load kg	Min. compression mm	Max. load kg	Max. compression mm	Hardness in ° Shore
	vertical	athwart-ships	fore and aft					
K50	1	0,75	2,5	25	2	50	4	45
K75	1	0,75	2,5	38	2	75	4	55
K100	1	0,75	2,5	50	2	100	4	65

These engine mountings are standard supply with the VETUS marine diesel engine M 2.06 (see page 112)

### TYPE MITSTEUN

This hydro-damper is a combination of a conventional rubber-metal damper and a hydraulic shock absorber. Especially for engines with 1, 2 or 3 cylinders, producing many horizontal and vertical movements, the VETUS hydro-damper is an absolute sensation: the reduction of vibration and noise is truly staggering. The maximum static load per support is 60 kg and the maximum thrust per support is 50 kg. In other words: dependent on gearbox ratio, number of revolutions, propeller diameter etc., these mountings are suitable for engines of up to 18 - 26 kW (25 - 35 HP).



Type	Stiffness ratio			Min. load kg	Min. compression mm	Max. load kg	Max. compression mm	Hardness in ° Shore
	vertical	athwart-ships	fore and aft					
Mitsteun	1	1	1	25	1,3	67	4,5	45

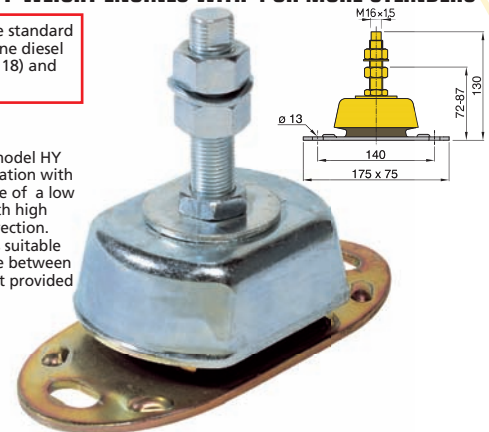
### MOUNTINGS FOR HEAVY-WEIGHT ENGINES WITH 4 OR MORE CYLINDERS

These engine mountings are standard supply with the VETUS marine diesel engines VH 4.65 (see page 118) and VH 4.80 (see page 119)

### TYPE HY

The VETUS vibration damper model HY is extremely suitable for application with marine diesel engines, by virtue of a low vertical stiffness, combined with high stiffness in the longitudinal direction. This sturdy vibration damper is suitable for engines in the power range between 30 and 125 kW, whether or not provided with a thrust bearing.

**These flexible engine mountings are suitable for marine diesel engines in the power range between 30 KW and 125 KW (40 HP - 170 HP).**



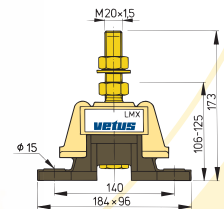
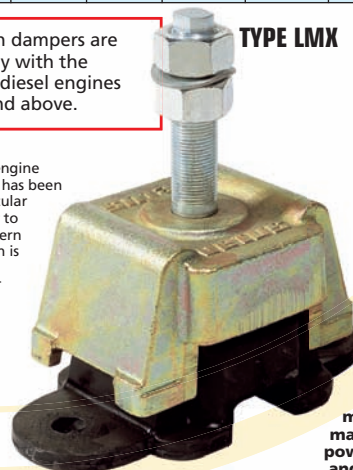
Type	Stiffness ratio			Min. load kg	Min. compression mm	Max. load kg	Max. compression mm	Hardness in ° Shore
	vertical	athwart-ships	fore and aft					
HY100	1	1,2	3,5	40	2	100	5	40
HY150	1	1,2	3,5	60	2	150	5	50
HY230	1	1,2	3,5	92	2	230	5	60

These vibration dampers are standard supply with the VETUS marine diesel engines model DT44 and above.

### TYPE LMX

The VETUS flexible engine mounting type LMX has been designed with particular regard to the power to weight ratio of modern diesel engines, which is of ever-growing importance. In other words: the weight of an engine, in comparison to its thrust, has become lower and lower. For these engine types, the VETUS flexible engine mounting type LMX possesses the following ideal characteristics:

- The ample vertical compression guarantees optimum damping of vibrations, even at idling revs.
- The horizontal fore and aft stiffness is very high, which allows the acceptance of considerable thrust.
- The cushioning of vibrations in horizontal direction athwartships is of equal excellence.



**These flexible engine mountings are suitable for marine diesel engines in the power range between 70 KW and 350 KW (95 HP - 480 HP).**

Type	Stiffness ratio			Min. load kg	Min. compression mm	Max. load kg	Max. compression mm	Hardness in ° Shore
	vertical	athwart-ships	fore and aft					
LMX140	1	1	7	85	3	140	5	35
LMX210	1	1	7	125	3	210	5	45
LMX340	1	1	7	205	3	340	5	55
LMX500	1	1	7	300	3	500	5	65

We are often asked why we offer 3 different types of flexible couplings for one and the same purpose. The answer is that, notably from the after-market, there is still a huge demand for replacement flexible couplings, for units already in service, like

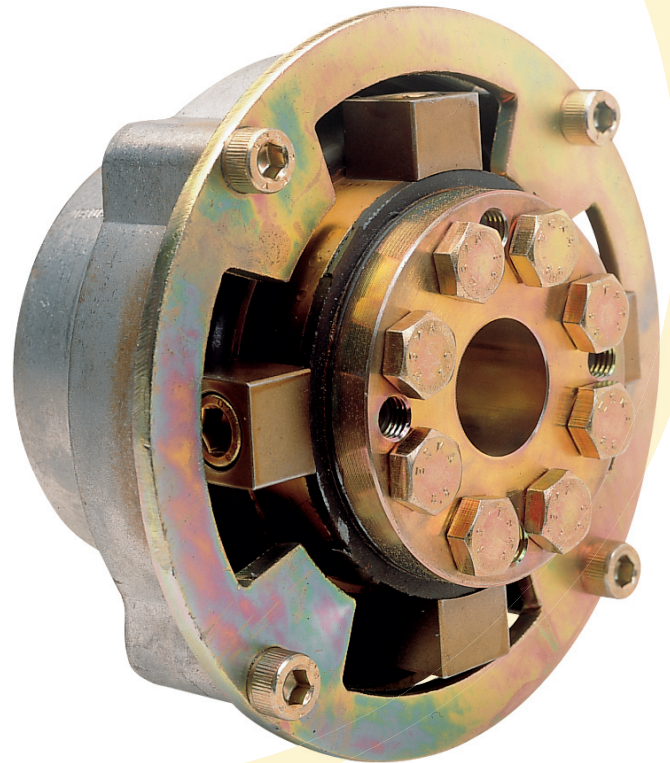
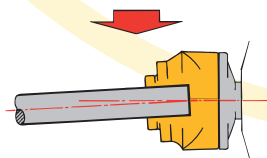
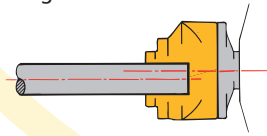
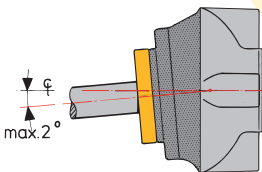
the type 6 and the Uniflex models. The Bullflex flexible couplings (see page 143) represent the latest, state-of-the-art technology and are therefore recommended for new installations.

### TYPE UNIFLEX

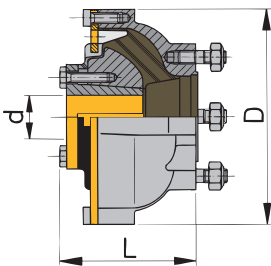
Exact alignment and concentric installation of a propeller shaft in a boat is not easy and often not even possible. VETUS flexible couplings of the Uniflex type solve these problems. In addition to the qualities of the VETUS couplings shown at the bottom of this page, Uniflex couplings have extra features that permit a **misalignment of 2°**, so that they will **centre** the shaft to the gearbox, resulting in an ideal flexible coupling for a propeller shaft with a self-aligning bearing and an engine on flexible supports. If the propeller shaft is connected to the engine at an angle of 2°, then the maximum admissible number of revolutions is 1500 r.p.m. on the shaft. These couplings are axially and radially secured against shearing off.

Uniflex couplings permit a misalignment of the propeller shaft of up to 2°.

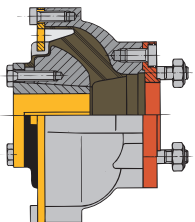
Uniflex couplings align the propeller shaft to the gearbox.



Flexible couplings, type Uniflex and Bullflex are **not** suitable for use with a V-drive.



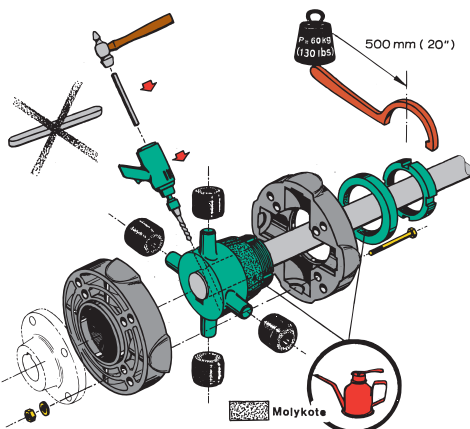
Type	DIN 6270 B = pleasure craft. kW/100 r.p.m. on shaft (HP)	Example: at 1500 r.p.m. the max. admissible power is (DIN B)	DIN 6270 A = commercial craft. kW/100 r.p.m. on shaft (HP)	D	L	d	Weight
Uniflex 12	2,1 (2,8)	15 x 2,1 = 31 kW (42 hp)	1,8 (2,5)	150 mm	94 mm	Ø 20, 25, 30	2,8 kg
Uniflex 16	4,2 (5,6)	15 x 4,2 = 62 kW (84 hp)	3,6 (5)	195 mm	127 mm	Ø 30, 35, 40	6,9 kg
Type 6	3,9 (5,3)	15 x 3,9 = 58,5 kW (79,5 pk)	3,3 (4,5)	138 mm	86 mm	Ø 20, 25, 30, 35	2,7 kg



Type Uniflex 12: with cylindrical bore and clamping hub for shafts with a diameter of 20-25-30 mm with a 4" connection for Hurth, Velvet, TD, ZF, PRM and other makes.

Type Uniflex 16: with cylindrical bore and clamping hub for shaft with a diameter of 30-35-40 mm with 4" and 5" connection for Hurth, Velvet, TD, ZF, PRM and other makes.

**For the most popular Volvo, Yanmar and Kanzaki gearboxes special adapter flanges are available, for proper installation of the Uniflex models 12 and 16 and type 6. Please see pricelist for the correct types.**

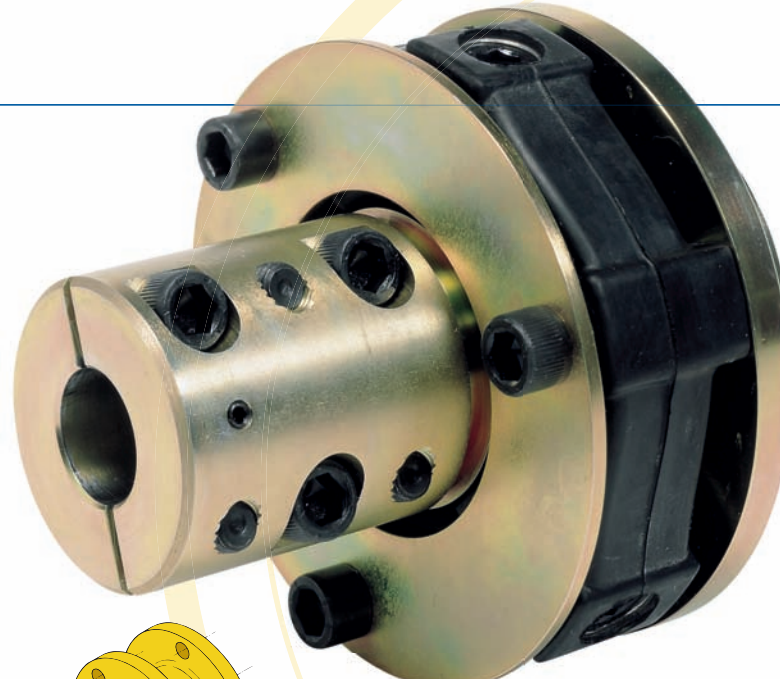


The VETUS flexible coupling **type 6** has a special conical clamping hub, which guarantees a 100% concentric fit. This saves installation time.



**TYPE 6:** pilot bored Ø 20 mm or with a cylindrical bore for Ø 25 - 30 - 35 mm shaft, with 4" and 5" connections for Hurth, Velvet, TD, ZF and PRM

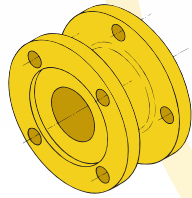
**TYPE 6**



## TYPE BULLFLEX

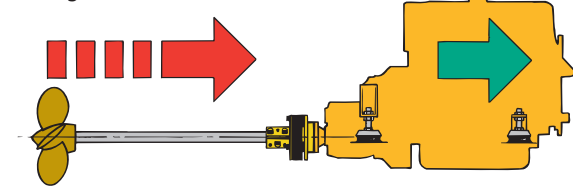
The VETUS "Bullflex" flexible coupling provides a conclusive answer to the increasing demand of greater boating comfort. The Bullflex coupling has been especially designed to ensure optimum damping of vibrations. Torsional vibrations which are due to cycle irregularities (especially at low revs) are smoothed out extremely efficiently, owing to its very flexible rubber element. This pre-tensioned rubber element ensures low-noise and vibration-free transmission, without backlash between the engine and the propeller shaft. The Bullflex coupling is secured against shearing off, both axially and radially, thus ensuring safe transmission under all circumstances.

Another strong point of the Bullflex coupling is the excellent alignment of the propeller shaft. Perfect alignment of engine and propeller shaft often tends to be a rather time consuming affair, but the Bullflex comes to the aid of the installation engineer. Even with a misalignment of 2°, the shaft will remain perfectly centered onto the flange of the reverse gearbox. On account of a special centering ring, high shaft revolutions are entirely possible and even in reverse gear, the shaft will remain perfectly centered. The non-tapered clamping hub ensures easy installation and - probably even more important: easy dismantling of the shaft assembly. This in contrast with a tapered clamping hub. Costly machining of the shaft, such as tapering and keyway-cutting is no longer required. Just cut the shaft to length, free of burrs, degrease and install.



The pump unit of some hydraulic gearboxes is positioned in such a way that it will be impossible to install the flexible coupling directly onto the output flange of the gearbox. In such cases, an intermediate flange will have to be fitted as well.

The Bullflex coupling has a built-in thrust damper, thus reducing axial vibrations. This ensures smooth transmission of the thrust onto the engine and engine mountings, which are thus subjected to lower loadings. Result: less vibrations.



Bullflex couplings no. 1, no. 2 and no. 4 have a 4" connection for the gearbox. Models no. 8, 12 and 16 feature both a 4" and a 5" connection. Bullflex model 32 is provided with 6 threaded M16 holes on a pitch circle diameter of Ø 120,65 mm (4.75 inch). This enables mounting of the Bullflex couplings to most models of gearboxes, made by Hurth, Velvet, TD, ZF and P.R.M.

**If required, VETUS can also supply the required fastenings for installation of the Bullflex onto the gearbox (see price-list).**

Example:

An engine has an output of 84 kW at maximum 3,600 r.p.m. and a gearbox ratio of 2.1:1.

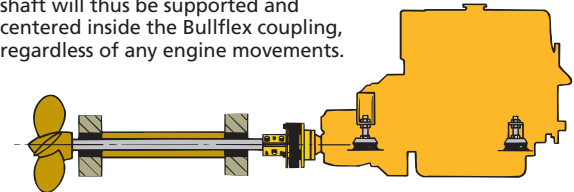
The maximum speed of the propeller shaft is  $\frac{3,600}{2,1} = 1,714$  r.p.m.

Therefore, the power to be transmitted per 100 r.p.m. is  $\frac{84}{17,14} = 4.9$  kW/100 r.p.m.

From the table, the correct model is a Bullflex 8 for a pleasure craft or a Bullflex 12 for a commercial craft. This formula can also be used with the relevant tables for Uniflex and Type 6 flexible couplings.

An engine on flexible mountings will by definition, always move. When the propeller shaft is installed rigidly - which means to say: supported by two or more non-flexible bearings - the propeller shaft should not be affected by engine movements.

If this should happen, damage of engine mounting, coupling and sealing of the shaft may result. Where a rigid shaft assembly is installed, the centering ring can be removed from the Bullflex coupling. This must be done if the distance between the output flange of the gearbox and the first shaft bearing is less than 20 times the shaft diameter. Pendulum movements of the flexibly mounted engine will then not be transmitted onto the propeller shaft, but will be effortlessly absorbed by the Bullflex coupling. Naturally, removal of the centering ring has no adverse effects on the vibration damping properties. Where the propeller shaft is supported by one rigid bearing only, the Bullflex coupling - with its centering ring installed - will function as a flexible ball joint. The propeller shaft will thus be supported and centered inside the Bullflex coupling, regardless of any engine movements.

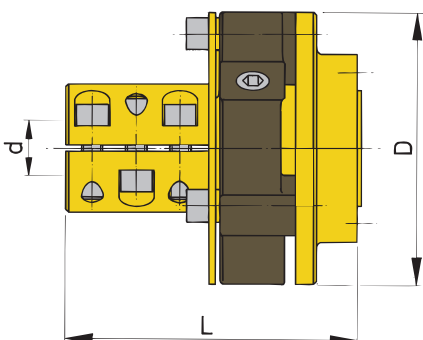


Adapter flanges for many models of gearboxes, made by Volvo, Yanmar and Kanzaki, are available as an option. Please see the pricelist for the adapter flange to suit your own gearbox.

### ADVANTAGES OF THE VETUS BULLFLEX COUPLING:

- very high flexibility
- optimum damping of vibrations
- secured against shearing off (axially and radially)
- misalignment of up to 2° permissible
- excellent centering of the shaft, allowing for high shaft revolutions, even at 2° misalignment
- the shaft will remain centered even in reverse gear
- possibility to remove the centering ring
- built-in thrust damper
- non-tapered clamping hub, for perfect centering and easy assembly/dismantling

### Technical data:



Type Bullflex	DIN 6270 B = pleasure craft kW (HP)/ 100 shaft RPM	DIN 6270 A = commercial craft kW (HP)/ 100 shaft RPM	maximum torque Nm		max. r.p.m. at zero misalignment	max. r.p.m. at 2° misalignment	D mm	L mm	d mm	d inch
			DIN 6270B	DIN 6270A						
1	0.8 (1.1)	0.5 (0.7)	75	45	7000	3500	100	85	20, 25	1.00
2	1.6 (2.1)	0.9 (1.3)	150	90	6500	3250	120	120	20, 25	1.00
4	3.1 (4.3)	2.1 (2.8)	300	200	6000	3000	150	152	25, 30	1.00
8	6.3 (8.5)	4.3 (5.8)	600	410	5000	2500	170	166	30, 35, 40	1.25, 1.50
12	9.8 (12.8)	7.1 (9.6)	900	540	4000	2000	200	177	35, 40, 45	1.50, 1.75
16	12.6 (17.1)	9.8 (13.3)	1200	935	4000	2000	205	197	40, 45, 50	1.50, 1.75, 2.00
32	23.0 (31.3)	18.6 (25.3)	2200	1780	3600	1800	260	263	45, 50, 60	1.75, 2.00



## WHY USE A WATER-INJECTED "WET" EXHAUST SYSTEM?

The following factors are of great importance:

- 1) Exhaust gas **temperatures** can reach very high levels.  
A diesel engine can easily produce an exhaust gas temperature of 600° C or more.
- 2) The **speed** with which sound can be transmitted through air is dependent on the temperature of the air. This applies to exhaust gases as well. The higher the exhaust temperature, the higher the speed of sound through the gas.
- 3) The **sound level**, i.e. the relative volume of sound as experienced by the human ear, is in turn dependent on the speed of sound. As the speed of sound transmission reduces, so the sound level will reduce proportionally.

In the past, many boats used a "dry" exhaust system, in which the exhaust gases were transported to outside the hull without any form of cooling.

The resultant hot exhaust pipe had to be thoroughly insulated, but even so, it produced a tremendous amount of noise. However, reduction of exhaust gas temperature to about 40° or 50°C can be achieved by injecting the engine cooling water into the exhaust line. This is how a "wet" exhaust system works. In addition, the typical diesel exhaust smell is also considerably reduced.

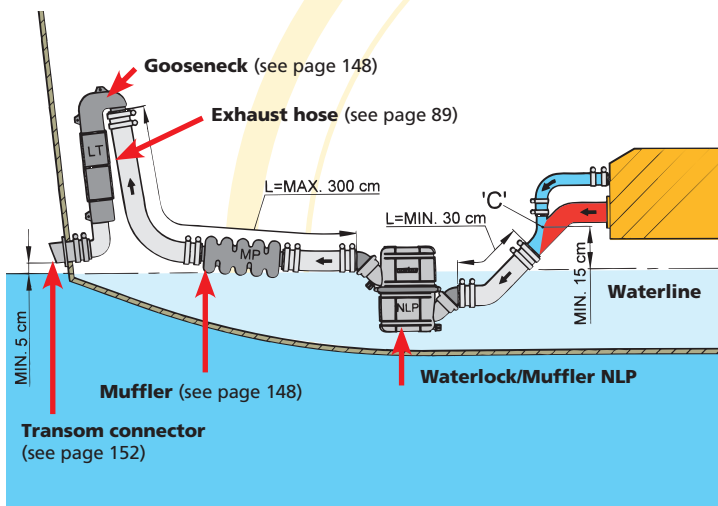
A further major advantage of reducing the temperature, is the fact that all exhaust components downstream from the engine outlet can be made from rubber or synthetic materials. This permits greater design sophistication and weight reduction and ensures freedom from corrosion.

## WHAT REQUIREMENTS MUST BE FULFILLED BY A "WET" EXHAUST SYSTEM?

In its simplest form, a rubber hose, running from the engine directly to the transom of the boat, seems adequate enough. However, the following issues must also be taken into consideration:

- After the engine is stopped, the cooling water in the exhaust system must not be able to flow back into the engine.
- Water outside the boat must be prevented from entering the exhaust system and therefore the engine, through the transom connection.

In order to fulfil these requirements, VETUS offers a complete range of exhaust components made of synthetic materials, such as:



Exhaust assemblies with the water injection point "C" **15 cm or more** above the waterline.

A **waterlock** (see pages 146 and 147) will collect the cooling water present in the system when the engine is stopped. In addition, a waterlock has great sound-deadening capabilities and acts as a very efficient muffler.

The size of the water lock is not only determined by the diameter of the exhaust hose, but also by the quantity of water that must be collected. Therefore, VETUS offers waterlocks with extra large capacity for systems with long exhaust runs.

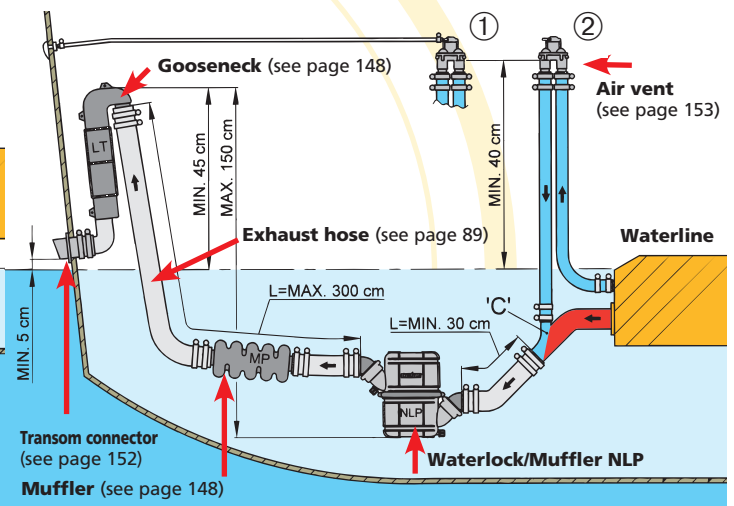
A **gooseneck** (see page 148) raises the exhaust hose above the waterline, so that water cannot backfill the exhaust system. After the engine is stopped, all cooling water in the exhaust hose will run to the lowest point of the system, which is where the waterlock should be situated. In order to limit the quantity of water, the gooseneck should be fitted as closely as possible behind the waterlock. But, if required, it may also be fitted directly onto the transom exhaust connection.

The **transom exhaust connection** (see page 152) should be fitted **above** the waterline, as a general rule.

We recommend VETUS **rubber exhaust hose** (see page 89) for all water-injected exhaust systems: VETUS exhaust hose is extremely flexible but it cannot collapse when subjected to heat and is resistant to exhaust gases, temperatures up to 100°C, and oil residues. These hoses are Lloyd's approved and satisfy the SAE J2006 R2 directives.

Always fit an **exhaust temperature alarm** (see page 149). in order to warn of excessive temperature in the exhaust system. This can happen if the cooling water flow is restricted or blocked altogether. VETUS marine diesel engines have an exhaust temperature alarm fitted as standard.

The height of the cooling **water injection point** into the exhaust system, relative to the external waterline, is of great importance. If the **water injection point is 15 cm or more above the waterline**, the cooling water may be injected directly into the exhaust system. However, if the **water injection point is less than 15 cm above the waterline (or even below it)** there is a risk that the cooling system will siphon water through the intake, once the engine is stopped. This water will fill up the exhaust system and eventually get back into the engine cylinders via the exhaust valves. This siphon action may be prevented by having a breather hose (1) in the cooling water line or by fitting an air vent (2).



Exhaust assemblies with the water injection point "C" **less than 15 cm** above the waterline.

**WATERLOCK/MUFFLERS (Ø 40-45-50-60-75-90 MM)**

The NLP waterlocks are of **dual stage construction**, featuring **upper and lower** chambers with a horizontal partition plate and a riser tube through the centre. Compared with single stage waterlocks using only one chamber, these NLP waterlocks offer superior silencing of exhaust noise with minimal back pressure. Since the top chamber may be rotated through 360° and both the inlet and the outlet connectors can rotate through 360°, installation of the exhaust assembly even in confined engine spaces is greatly simplified.

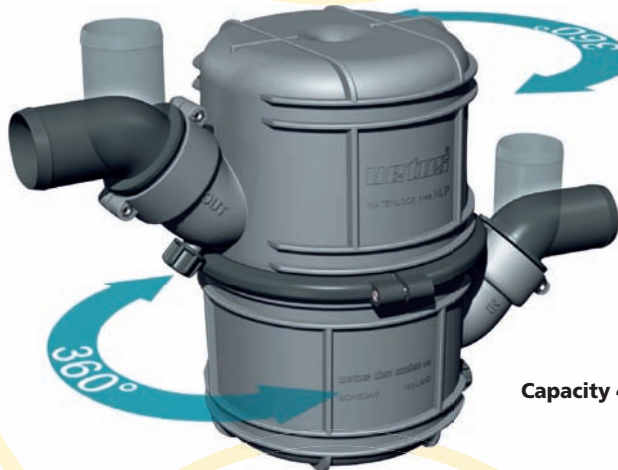


**NLP**

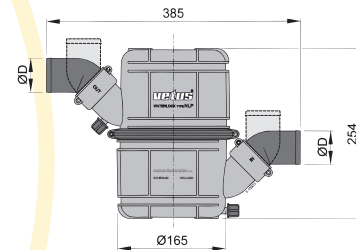
**HOW THESE WATERLOCKS OPERATE**

The rotatable inlet of the waterlock is connected to the engine exhaust manifold, using VETUS exhaust hose (see page 89). The exhaust gases, mixed with cooling water are forced from the lower chamber into the upper one, via the central riser tube and then through the (also rotatable) outlet connector at the top. This outlet connector is coupled to the transom connector, again by means of VETUS exhaust hose. For optimum silencing of exhaust noise, we recommend installation of a VETUS muffler and gooseneck (see page 148) in the exhaust line, after the NLP waterlock.

**WATERLOCK/MUFFLERS NLP 40 - 45 - 50**



**Capacity 4.5 litres**

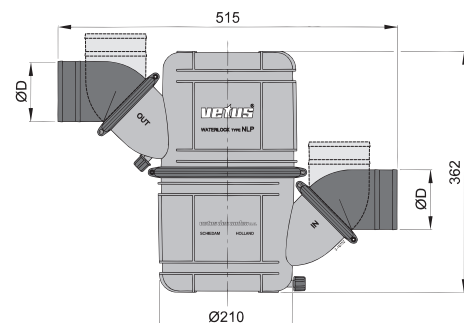


Suitable for exhaust hose with inside diameter of resp. Ø 40 mm, Ø 45 mm, Ø 51 mm, Ø 60 mm, Ø 76 mm or Ø 90 mm. Provided with drain plugs (for winter storage). Straps to secure the waterlock to the boat are supplied as standard. Capacity 4.5 and 10 litres.

**WATERLOCK/MUFFLERS NLP 50S - 60 - 75 - 90**



**Capacity 10 litres**



**MATERIAL OF THESE WATERLOCKS: SYNTHETIC**

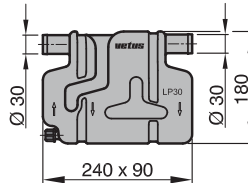


**WLOCKLP**

Capacity 2.3 litres

**WATERLOCK LP 30**

Suitable for exhaust hose with 30 mm I.D. Provided with a drain plug for winter storage.

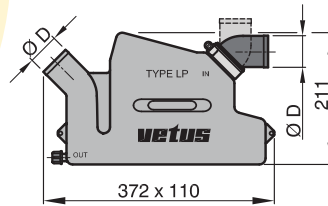


**WLOCKL**

Capacity 4.3 litres

**WATERLOCK LP40R / LP45R / LP50R**

For exhaust hose with internal diameters of 40 mm, 45 mm or 51 mm I.D. Provided with a plug for draining during winter time. The inlet connection of these 3 models will **revolve through 360°**, which greatly facilitates the installation of the exhaust assembly. There is a larger waterlock for 51 mm I.D. hose (shown below) which is recommended for assemblies with longer length exhaust hose (more than 4 metres total hose length).

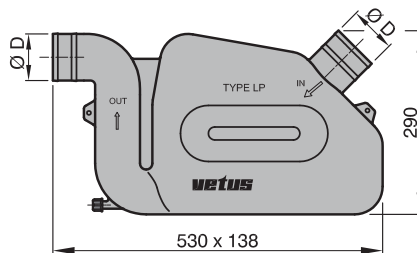


**WLOCKLP**

Capacity 10.5 litres

**WATERLOCK LP 50S / LP 60 / LP 75 / LP 90**

For exhaust hose with internal diameters of 51 mm, 60 mm, 76 mm or 90 mm I.D. The smaller model L50R, shown above, is to be used when the exhaust line is relatively **short**, whereas the larger model LP50S should be used with a **long length** of exhaust hose. These waterlocks are provided with a drain plug.



**WARNING OUR VETUS WATERLOCKS, MUFFLERS AND GOOSENECKS MAY ONLY BE APPLIED IN COMBINATION WITH VETUS OR OTHERWISE APPROVED REINFORCED EXHAUST HOSE. USE VETUS COMPONENTS FOR COMPLETE SATISFACTION.**

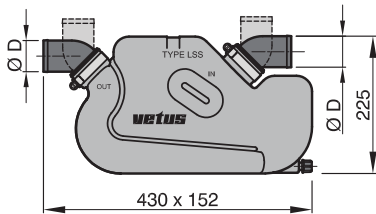
## WATERLOCKS FOR LONG EXHAUST SYSTEMS

Sometimes, notably in the case of sailing yachts, the exhaust line is so long that an extra large waterlock is needed to prevent the large volume of water in the line from running back into the engine once it has been stopped. VETUS waterlocks type LSG, LSS and LSL are the ideal solution for boats sailing in rough waters, without the engine running.

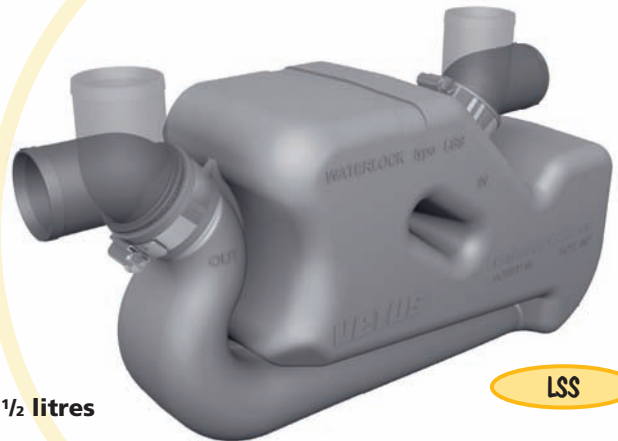
To simplify installation of models LSS and LSG, both the inlet and outlet stubs will rotate through 360 degrees. They are also fitted with a drain plug for winter storage. It is possible to fit a sensor for an exhaust temperature alarm into the inlet hose connection of the LSG. Model LSS features a reduced height of 225 mm, thus enabling easy installation under floor.

### WATERLOCK LSS 40 / LSS 45 / LSS 50

Hose connection  $\varnothing$  40, 45 or 51 mm. Inlet and outlet stubs will rotate through 360 degrees. One securing strap is standard supply.

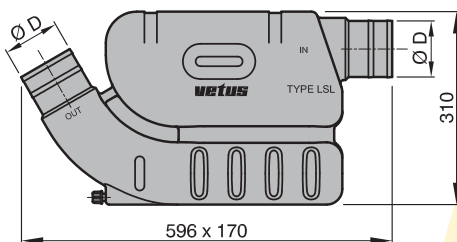


Capacity 7½ litres



### WATERLOCK LSL 60 / LSL75 / LSL 90

These waterlocks are designed for long relatively straight exhaust runs, for example in sailing boats. They have fixed (non-rotating) inlet and outlet connections and are available for  $\varnothing$  60 mm, 75 mm or 90 mm internal diameter exhaust hose. Two securing straps are standard supply.

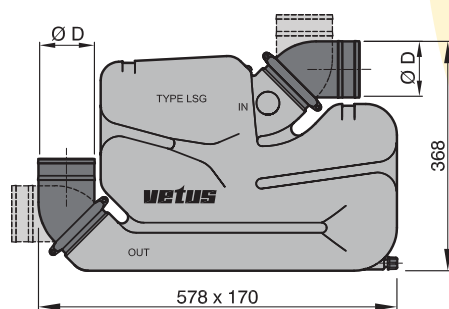


Capacity 16 litres

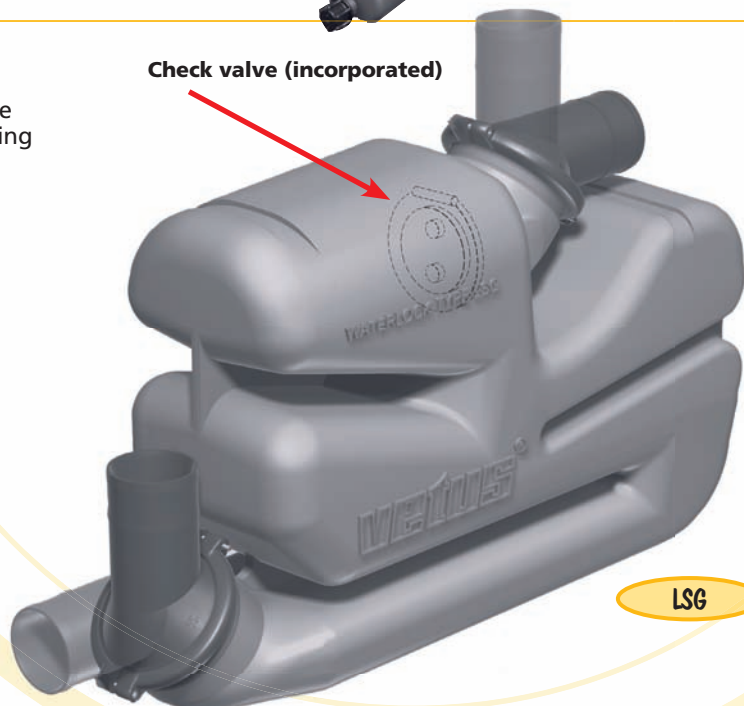


### WATERLOCK LSG 60 / LSG 75 / LSG 90

Hose connection  $\varnothing$  60, 76 or 90 mm. With check valve and the inlet/outlet stubs will rotate through 360 degrees. Two securing straps are standard supply.



Capacity 17 litres



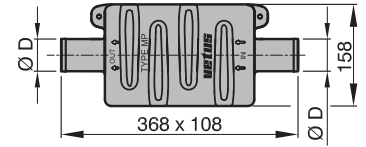


**DEMPMP**

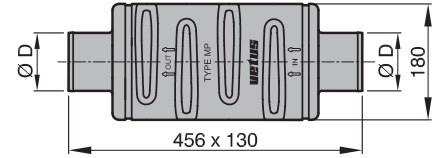


### MUFFLER

Available for exhaust hoses of  $\varnothing$  40 mm, 45 mm, 51 mm, 60 mm, 75 mm, 90 mm or 102 mm I.D. This muffler creates additional mixing of the water inside the exhaust line, which results in even better noise reduction. The construction of the muffler causes almost no resistance to the free flow of the exhaust gases.



- MP 40 ( $\varnothing$  40 mm)
- MP 45 ( $\varnothing$  45 mm)
- MP 50 ( $\varnothing$  51 mm)
- MP 60 ( $\varnothing$  60 mm)
- MP 75 ( $\varnothing$  76 mm)

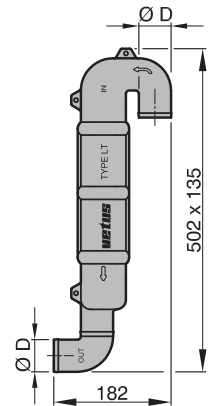


- MP 90 ( $\varnothing$  90 mm)
- MP 100 ( $\varnothing$  102 mm)



### GOOSENECK LT 40 / LT 45 / LT 50 / LT 60

Available for exhaust hose of  $\varnothing$  40 mm,  $\varnothing$  45 mm,  $\varnothing$  51 mm or  $\varnothing$  60 mm I.D.

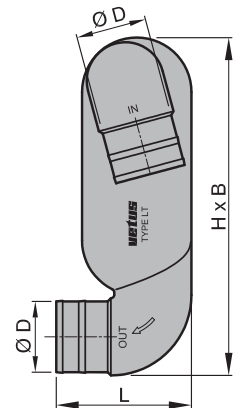


**WLOCKLT**

### GOOSENECK LT 75 / LT 90-90 LT 102 / LT 127 / LT 152

Available for exhaust hose of  $\varnothing$  76 mm,  $\varnothing$  90 mm,  $\varnothing$  102 mm  $\varnothing$  127 mm or  $\varnothing$  152 mm I.D. Stainless steel fastening brackets are supplied as standard with these goosenecks.

$\varnothing$	D	B	L	H
LT 75	75	235	155	500
LT 90	90	300	210	525
LT 102	102	300	210	525
LT 127	127	380	275	565
LT 152	152	380	275	565



**LT**



An engine with a water injection exhaust elbow with an external diameter of 57 mm (2¼") may be connected to  $\varnothing$  60 mm VETUS exhaust hose. In this case VETUS waterlocks, mufflers, goosenecks and transom connections with a size of  $\varnothing$  60 mm can be used as well.

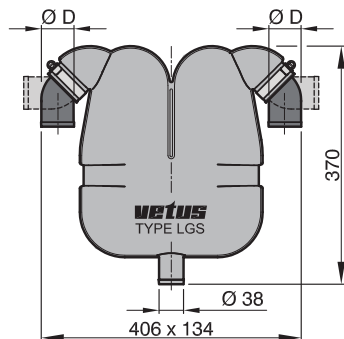
**THIS PLASTIC GOOSENECK PREVENTS SEAWATER FROM ENTERING INTO THE ENGINE VIA THE TRANSDOM CONNECTION.**

# GAS/WATER SEPARATOR **vetus**® |

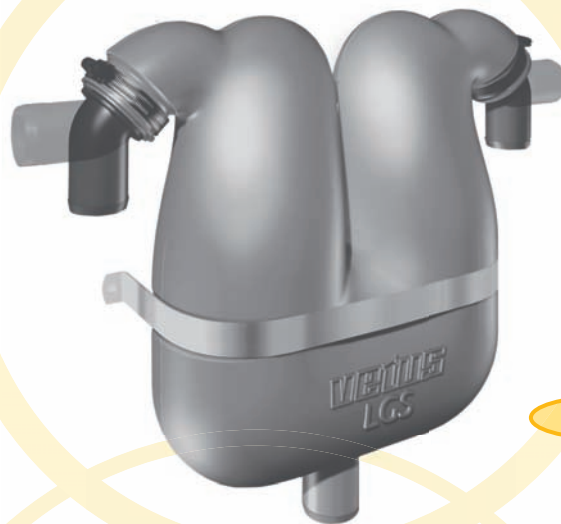
## FOR MARINE ENGINES AND GENERATOR SETS

**Generator sets** and **marine diesel engines** often produce disturbing, gurgling **exhaust noises**. The VETUS gas/water separator type LGS offers the ultimate solution, because it separates the injected raw cooling water from the exhaust gases. In addition, the LGS gas/water separator has great sound-deadening capacities and it functions as a gooseneck as well. The models LGS 40/45/50 are supplied with hose connectors with diameter  $\varnothing$  40, 45 or 50 mm, which can **rotate through 360°** and they have a capacity of 7 litres. The cooling water drain pipe has a diameter of  $\varnothing$  38 mm.

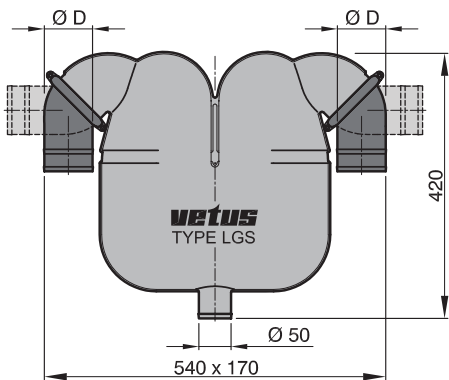
The models LGS 60/75 have 360° rotatable connectors, with a diameter of  $\varnothing$  60 or 75 mm. The capacity is 12 litres and the cooling water drain pipe has a diameter of  $\varnothing$  50 mm. A stainless steel mounting bracket with synthetic straps is standard with all models.



40 mm  
D : 45 mm  
50 mm



LGS



D : 60 mm  
75 mm



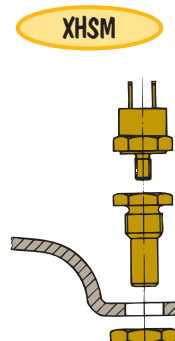
LGS

## EXHAUST TEMPERATURE ALARM

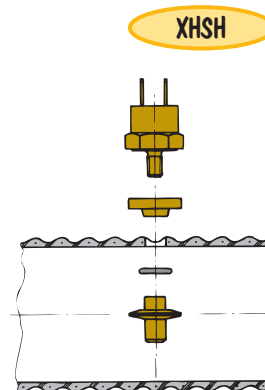


A blockage in the engine water intake or a damaged pump impeller will result in complete loss, or severe reduction in the volume of cooling water in the exhaust system. In this case the temperature of the exhaust will rise much faster than the temperature of the engine. We recommend that a VETUS exhaust temperature alarm is always installed in the exhaust line. This alarm is designed for water injected exhaust systems. It provides a visual and an audible alarm when the temperature inside the exhaust hose or the muffler exceeds an acceptable level.

**The temperature sensors**, to be fitted into the exhaust hose or the waterlock/muffler, and the **alarm unit** must be ordered separately. In the case of a twin engine installation 2 sensors may be connected to 1 alarm unit, if so required. One sensor may also serve two alarm units, e.g. in the case of a second steering position. Cut-out dimensions:  $\varnothing$  52 mm. Outside dimensions:  $\varnothing$  62 mm. Available for 12 and 24 Volt D.C.

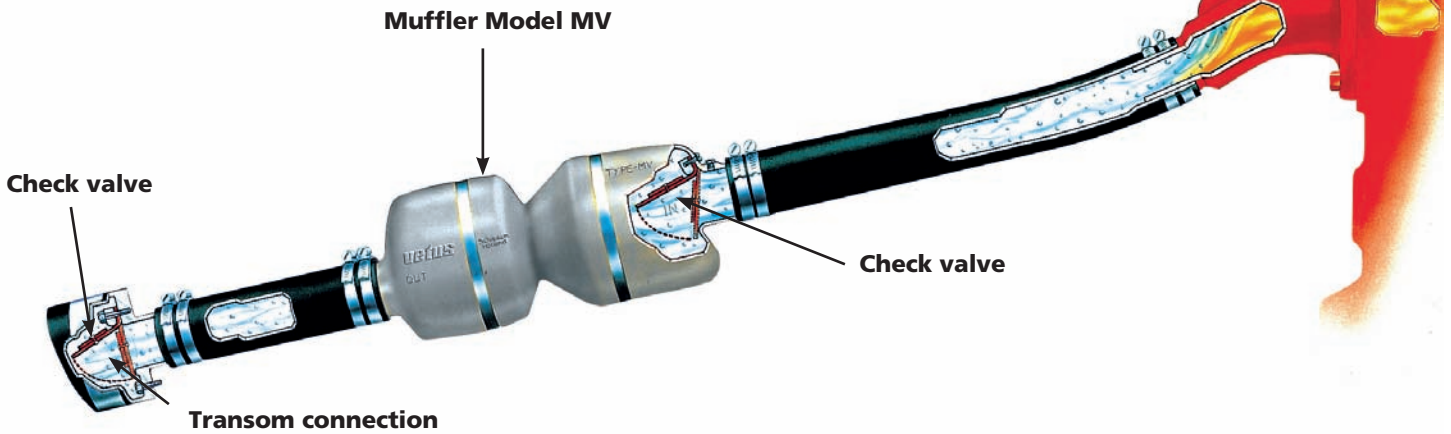


Muffler connection



Exhaust hose connection

Specially developed for fast craft with powerful engines, where very often there is no space available for installation of a waterlock and/or gooseneck.



- Application in combination with **water-injected** exhaust systems only.
- All parts are made of synthetic materials (no corrosion).
- Tremendous reduction of exhaust noise.
- Back pressure is absolutely minimal.
- Compact dimensions and light-weight.
- Stainless steel mounting brackets for the muffler are standard supply.
- The transom connection can be stainless steel (model TRCS), or reinforced black plastic, with a stainless steel band (model TC). Both types are provided with a check valve. Please see page152.

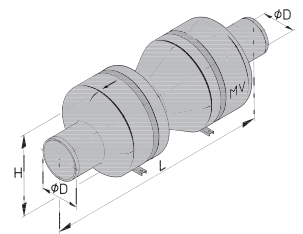
- With the muffler model MV a temperature sensor for the raw water alarm is optional and can be supplied with the muffler. The muffler and the transom connection of this exhaust system may only be installed when the transom connection is positioned at least **5 cm lower** than the outlet of the engine's exhaust manifold, in which case the flow of the seawater, injected into the exhaust bend, will always be directed away from engine. Both the muffler and the transom connection are provided with a **check valve** ("flapper"), which ensures that **under no circumstances** (e.g. when in waves or manoeuvring astern) can the seawater flow towards the engine. Therefore, this system makes the installation of a gooseneck unnecessary.

Each MV muffler features a connection for a temperature sensor, which triggers an audible alarm if the temperature of the exhaust gases/cooling water mixture exceeds an acceptable level. This ensures the best protection for the engine, as it provides an immediate warning when the raw water flow is impeded, long before the coolant in the engine itself becomes overheated. VETUS marine engines, though, do not require such (additional) security device, as they all feature an exhaust temperature alarm as standard equipment.



**MODEL MV (with check valve)**

D	H	L
Ø 90	Ø 210	702
Ø 100	Ø 210	702
Ø 125	Ø 320	910
Ø 150	Ø 320	910



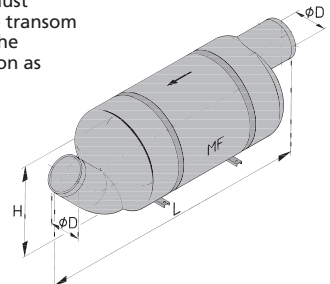
## MUFFLER MODEL MF



The muffler model MF may also be used for fast boats with powerful engines and is more suitable when the exhaust hose has to run low down in the boat. In this case the transom outlet does not need to be lower than the outlet of the engine exhaust manifold. The muffler will also function as a waterlock when the engine is stopped.

- For hose diameters 90 mm and 102 mm: volume 13 litres
- For hose diameters 127 mm and 152 mm: volume 43.5 litres
- Capacity 43.5 litres.

D	H	L
Ø 90	Ø 210	728
Ø 100	Ø 210	735
Ø 125	Ø 320	940
Ø 150	Ø 320	959



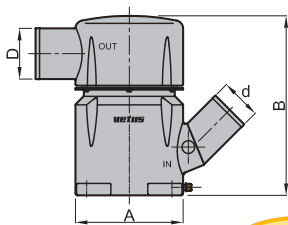
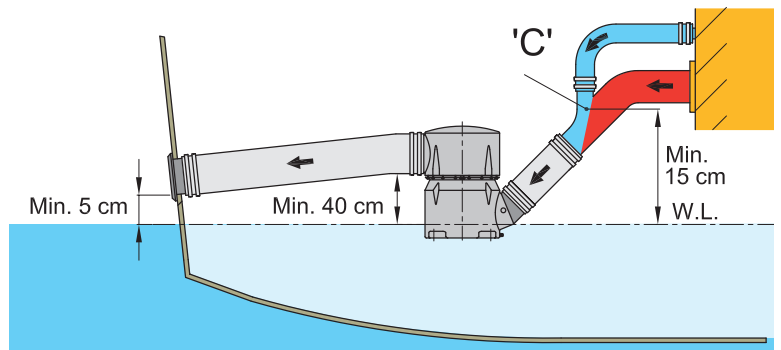
**These VETUS MV and MF mufflers are to be installed solely in combination with approved reinforced rubber exhaust hose (see page 89).**

In some boats the (VETUS) exhaust muffler must be positioned so closely behind the engine's exhaust manifold (this is especially true in the case of near horizontal exhaust assemblies), that the injected cooling water does not always mix properly with the hot exhaust gases. This often results in the exhaust hose and/or the muffler becoming overheated. Installation of a VETUS water mixer directly behind the exhaust manifold will overcome this problem. The water mixer is available for exhaust hoses with inside diameter of 90, 100, 125 or 150 mm.



# WATERLOCKS FOR EXHAUST OF Ø 90 - Ø 250 MM. |

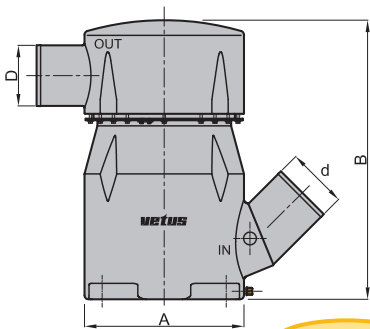
Often in a modern high performance boat, with one or two large engines installed, there is very little space to spare in the engine room. VETUS waterlocks, model MG are designed to make even the most awkward installation possible. The outlet connection at the top will rotate through 360° and the inlet connection is at an angle of 45° upward. Models with horizontal inlet connection, or angled 15° or 30°, are available to special order, minimum quantity of 10 units per order. VETUS waterlocks, type MG, may only be installed in water injected exhaust systems. They are made entirely of synthetic materials (no corrosion or galvanic action), have excellent sound reduction properties and cause minimal back pressure. The clamp bands are made of stainless steel. Provided with a drain cock for winter storage.



**MGP**

Type	d	D	A	B
MGP9090	ø 90	ø 90	ø 270	450
MGP102102	ø 102	ø 102	ø 270	450
MGP5455	ø 127	ø 127	ø 270	450
MGP102127	ø 102	ø 127	ø 270	450

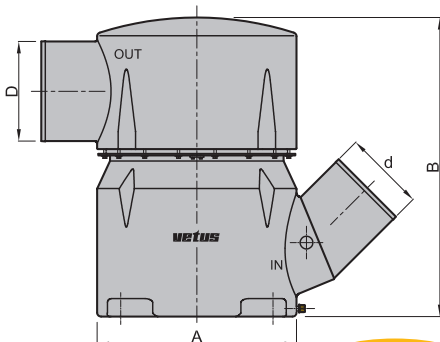
Capacity: approx 23 litres



**MGS**

Type	d	D	A	B
MGS5455	ø 127	ø 127	ø 400	700
MGS5456	ø 127	ø 152	ø 400	700
MGS6456	ø 152	ø 152	ø 400	700

Capacity: approx 75 litres



**MGL**

Type	d	D	A	B
MGL6458	ø 152	ø 203	ø 500	750
MGL8458	ø 203	ø 203	ø 500	750
MGL84510	ø 203	ø 250	ø 500	750

Capacity: approx 130 litres





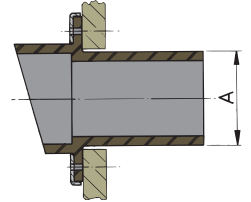


**TRCR**

### TRANSOM EXHAUST CONNECTIONS (MADE OF EDPM RUBBER) Ø 40 - 90 MM.

Can be mounted to the transom easily and flexibly. The rubber connector is mounted to the outside of the transom by means of a 2 mm thick stainless steel polished mounting ring. VETUS mufflers and goose necks with corresponding dimensions can be fitted directly. For connection of the exhaust hose, a plastic hose connector will be required.

Type	For exhaust hose (I.D.)	A = hole size
40	40 mm	Ø 53 mm
45	45 mm	Ø 58 mm
50	51 mm	Ø 63 mm
60	60 mm	Ø 73 mm
76/90	76 and 90 mm	Ø 111 mm

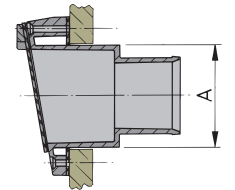
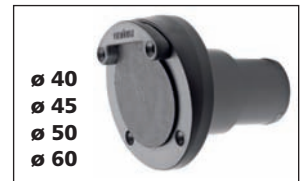


**TRCPV**

### TRANSOM EXHAUST CONNECTIONS WITH CHECK VALVE (MADE OF PLASTIC) Ø 40 - 90 MM.

The exhaust hose can be fitted directly to this transom connection.

Type	For exhaust hose (I.D.)	A = hole size
40	40 mm	Ø 52 mm
45	45 mm	Ø 52 mm
50	51 mm	Ø 68 mm
60	60 mm	Ø 68 mm
75	76 mm	Ø 97 mm
90	90 mm	Ø 97 mm

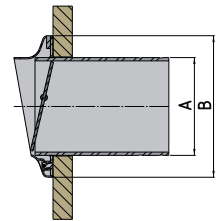


**TRCSV**

### TRANSOM EXHAUST CONNECTIONS WITH CHECK VALVE (MADE OF STAINLESS STEEL AISI 316) Ø 40 - 150 MM.

The exhaust hose can be fitted directly to this transom connection.

Type	For exhaust hose (I.D.)	A = hole size	B Ø mm
40	40 mm	Ø 41 mm	74
45	45 mm	Ø 46 mm	79
50	51 mm	Ø 51 mm	84
60	60 mm	Ø 61 mm	94
75	76 mm	Ø 77 mm	110
90	90 mm	Ø 91 mm	123
100	102 mm	Ø 103 mm	140
125	127 mm	Ø 128 mm	169
150	152 mm	Ø 153 mm	194

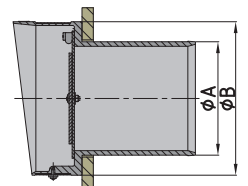


**TC**

### TRANSOM EXHAUST CONNECTIONS WITH CHECK VALVE (MADE OF PLASTIC) Ø 90 - 150 MM.

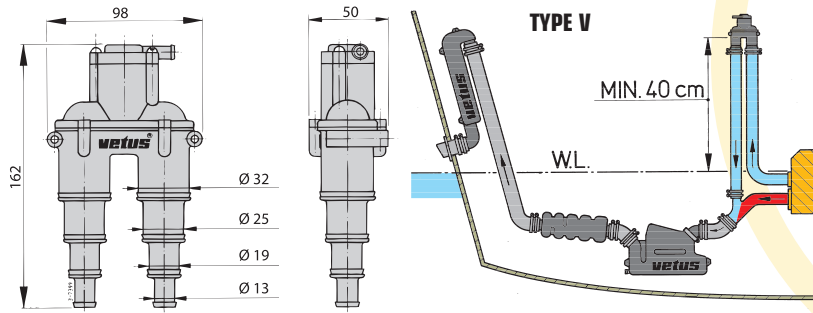
The exhaust hose can be fitted directly to this transom connection.

Type	For exhaust hose (I.D.)	A = hole size	B Ø mm
90	90 mm	Ø 93 mm	141
100	102 mm	Ø 103 mm	155
125	127 mm	Ø 128 mm	178
150	152 mm	Ø 153 mm	203



If the injection point of the cooling water line into the exhaust is situated at a height of less than 15 cm above the waterline, then – when the engine is stopped – there is a risk that the cooling water may enter the engine, as a result of siphoning. Such siphoning may be avoided by positioning a VETUS air vent into the cooling water tubing, at least 40 cm above the waterline.

**WITH PRESSURE VALVE**



**AIRVENTV**

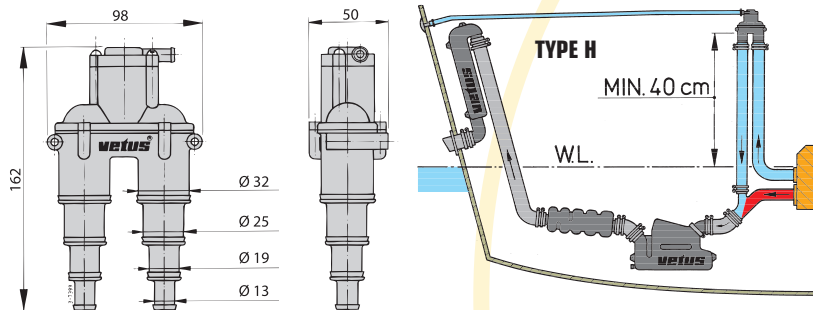
There is a choice of two models:

**AIRVENTV:** Model V has a reliable anti-siphon pressure valve and is self contained. However, it requires periodic maintenance to prevent clogging with salt crystals.

**AIRVENTH:** Model H has a hose connection to the outside of the hull. There is a constant bleed off of cooling water through this hose whilst the engine is running. Model H comes complete with a skin fitting, hose clamps and 4 metres of hose.

Material of the housing: synthetic. Suitable for hoses of  $\varnothing$  13 mm, 19 mm, 25 mm and 32 mm internal diameter.

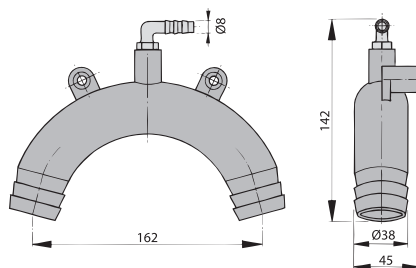
**WITH VENTILATION LINE**



**AIRVENTH**

**ANTI-SIPHON BREATHER-KIT**

Breather, suitable for  $\varnothing$  38 hose. Plastic housing. Comes complete with skin fitting, hose clamps and 2 metres of breather hose.



A VETUS air vent type AIRVH is also perfectly suitable for toilets which are installed below the waterline and for the discharge lines of waste water tanks.



**AIRVH38**

A propeller is possibly the most essential component of a motorboat and very important for sailing boats too. It requires a lot of attention, both by the naval architect and by the propeller manufacturer. "Specialists", who are able to tell you "off the cuff" what type of propeller your boat requires, simply do not exist. VETUS makes good use of an especially developed computer programme, which ensures the determination of the exactly right propeller for your boat, with the aid of some (correct) information, which we require from you.

What are the most important demands made upon a propeller?

**Balance**

If you bear in mind that a propeller is often rotating at 2.000 r.p.m. (which is more than **30 revolutions per second!**), you will appreciate that a good propeller should be **well-balanced**. A difficult and time-consuming job, but an absolute "must" nonetheless.

**Dimensions**

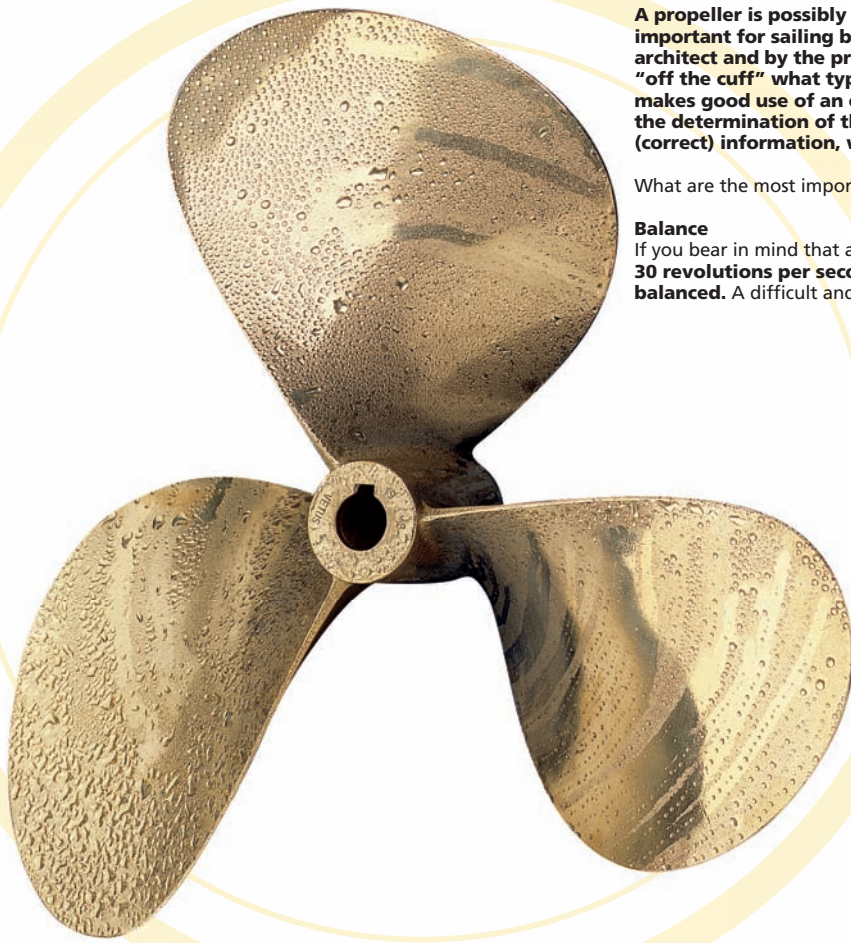
In order to achieve the best performance and to prevent vibrations, it is extremely important to ensure that the pitch of each blade is **identical** and also that the distance between the blades does not vary. Again, this requires great manufacturing precision.

**Material**

"Bronze" is the common denominator of a great variety of alloys. VETUS propellers are made of **manganese bronze**, an extremely resilient, yet very flexible material. By virtue of their material specifications, VETUS propellers, when damaged, can nearly always be repaired. The choice of a good (VETUS) propeller, combining all qualities mentioned above, is therefore of utmost importance! The diameter and the pitch of propellers are nearly always given in inches (1" = 25.4 mm).

**BLADE AREA**

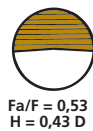
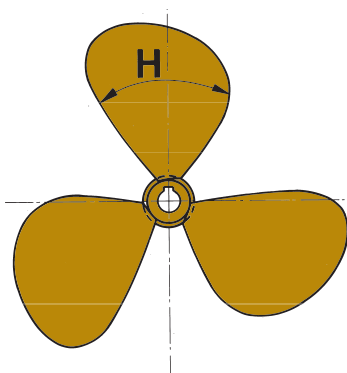
In order to specify the correct propeller, the propeller specialist must first of all determine the required Fa/F ratio. Each propeller has a fixed Fa/F ratio. This means the total area of the propeller circle (F) in comparison to the surface area (stretched and developed) of all blades together (Fa). The choice of the Fa/F ratio is dependent on the shape of the underwater section and the speed of the boat in question.



Standard taper of shaft holes of VETUS propellers (1:10). Dimensions according to ISO 4566

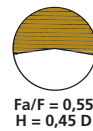
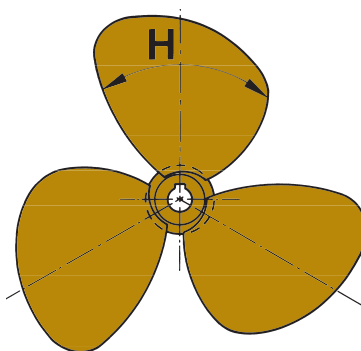
Propeller diameter			Largest diameter D	Smallest diameter d	Hub length L	Keyway width B
3-bladed propeller P3B	3-bladed propeller P3C	4-bladed propeller P4E				
12"-15"	12"-15"	14"-15"	25 mm	19 mm	60 mm	8 mm
16"-18"	16"-18"	16"-17"	30 mm	22 mm	80 mm	8 mm
19"-21"	19"-21"	18"-20"	35 mm	26 mm	90 mm	10 mm
22"-24"	22"-24"	21"-22"	40 mm	30 mm	100 mm	12 mm
25"	25"	23"-24"	45 mm	34 mm	110 mm	14 mm
greater than 25"	greater than 25"		50 mm	38 mm	120 mm	14 mm

**VETUS PROPELLERS WITH DIAMETERS BETWEEN 12" AND 24" (30-60 CM) IN STOCK!**



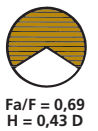
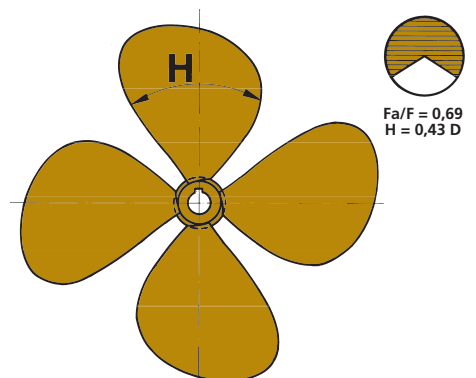
**3-BLADED PROPELLER**

Type P3B  
Suited to "displacement" craft with speeds of up to 10 knots.



**3-BLADED PROPELLER**

Type P3C  
Suited to fast craft with speeds of more than 16 knots.



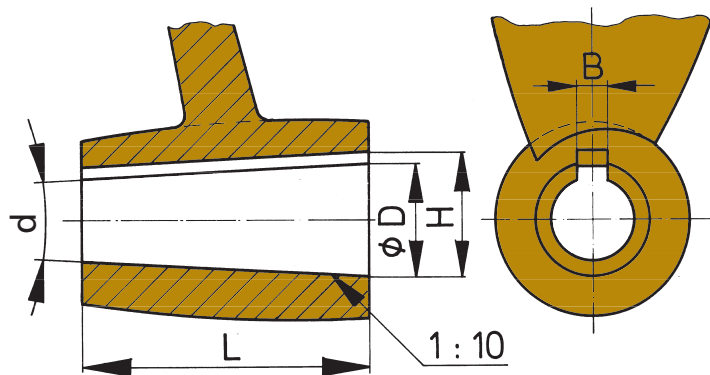
**4-BLADED PROPELLER**

Type P4E  
Suited to "semi-planing" boats with speeds of up to 16 knots.

**VETUS has large permanent stocks of type P3B, P3C and P4E propellers, with standard shaft holes and keyway sizes as indicated in the table. Propellers of different types and dimensions are available to special order, with a delivery time of 10 to 12 weeks.**

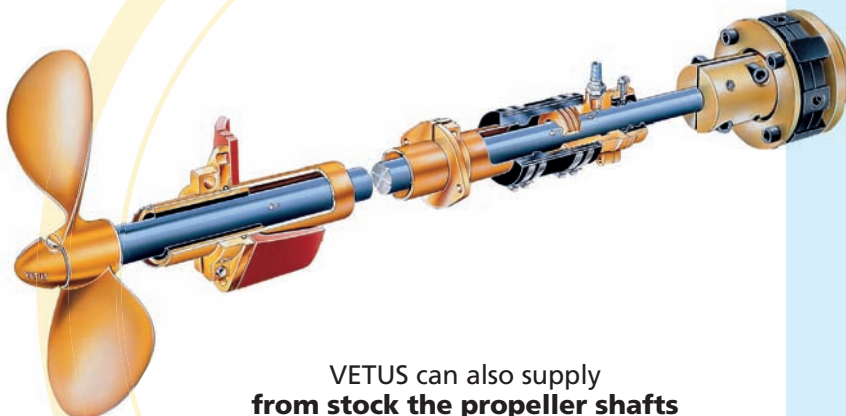
## HOW TO ORDER?

Please give us the dimensions of the propeller's diameter and pitch, as well as the number of the blades, the sense of rotation and the dimensions of the boss and the taper, according to the sketch here below.



## TAPERING OF THE PROPELLER SHAFT

All propellers in stock at VETUS have the standard taper 1:10. This means that the difference between the largest and the smallest diameter of the tapered hole represents 10% of the length of the propeller's boss ( $D-d=0.1xL$ ). If required, we can machine the boss to a taper of 1:12, 1:16, etc. It takes a few days extra delivery time plus a small surcharge. (see pricelist)



VETUS can also supply **from stock the propeller shafts** to match. (see page 156 to 159)

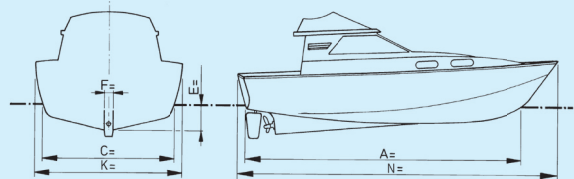
Should one or more data of the propeller be missing, please send us the relevant characteristics of your craft, as per this form.

VETUS N.V.  
Fokkerstraat 571 - 3125 BD Schiedam - tel. +31 10-4377700 -  
fax Sales department Benelux +31 10-4621286, Email: sales@vetus.nl

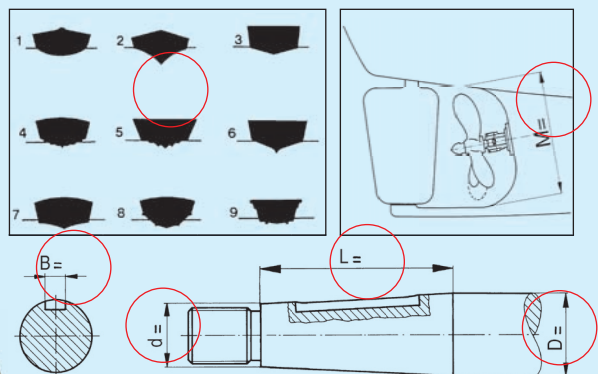
### Data sheet for propeller calculation

Name of Customer: .....  
 Address: .....  
 Town: .....  
 Telephone: .....  
 Fax: .....  
 Type of vessel: .....  
 Material: .....  
 Displacement (weight): .....  
 Speed: .....

**PLEASE GIVE ALL REQUIRED DIMENSIONS IN MILLIMETRES.**



Type of engine: .....  
 HP (max.) ISO 3046-1/DIN/SAE: .....  
 Number of revolutions (max.): .....  
 Reduction of gearbox: .....  
 Type of gearbox: .....  
 Number of propellers: .....  
 Type of propeller: .....  
 Sense of rotation: .....



Don't forget to fill in the red circles.

Standard taper of shaft holes of VETUS propellers (1:10). Dimensions according to ISO 4566.

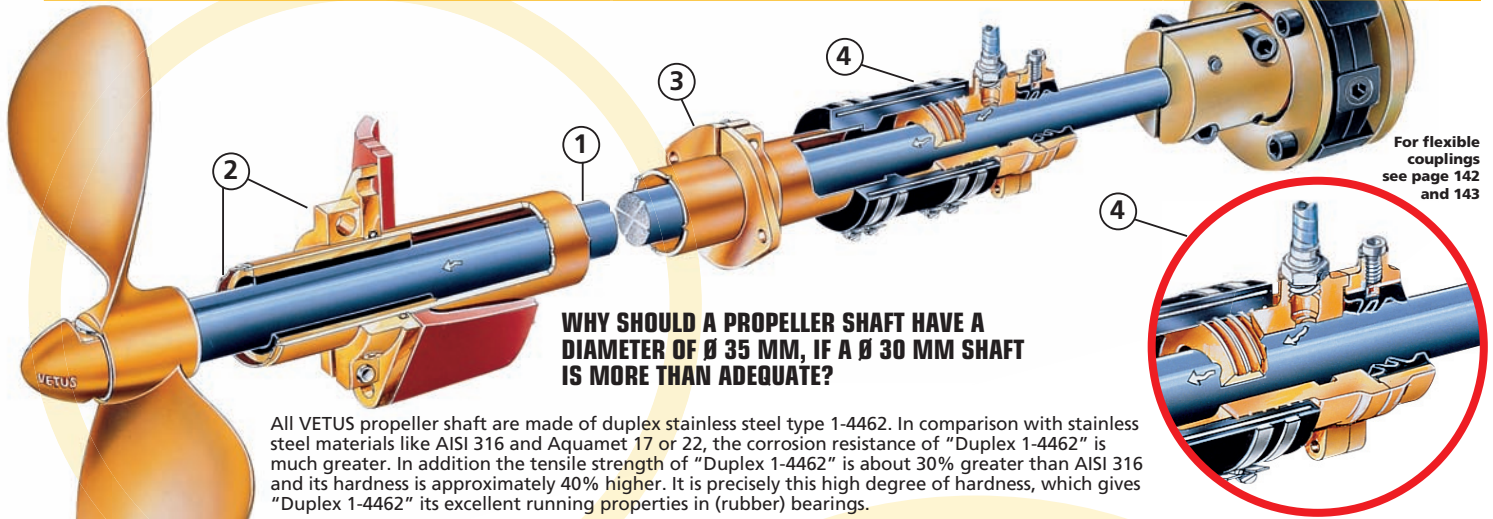
Propeller Diameter			Largest diameter shaft hole D	Smallest diameter shaft hole d	Hub length L	Keyway width B
3 bladed propeller P3B	3 bladed propeller P3C	4 bladed propeller P4E				
12"-15"	12"-15"	14"-15"	25 mm	19 mm	60 mm	8 mm
16"-18"	16"-18"	16"-17"	30 mm	22 mm	80 mm	8 mm
19"-21"	19"-21"	18"-20"	35 mm	26 mm	90 mm	10 mm
22"-24"	22"-24"	21"-22"	40 mm	30 mm	100 mm	12 mm
25"	25"	23"-24"	45 mm	34 mm	110 mm	14 mm
greater than 25"	greater than 25"		50 mm	38 mm	120 mm	14 mm

Propeller type and size as recommended by VETUS: .....

**VETUS** VETUS N.V.  
Fokkerstraat 571 - 3125 BD Schiedam - Holland  
Calculated by: .....

## ESPECIALLY DEVELOPED FOR SMALLER ENGINES

For use with less powerful engines, VETUS have designed and developed a shaft assembly – with shaft diameters of Ø 25 mm and Ø 30 mm - which can be installed with a minimum of fuss. Machining, threading and keyway cutting have all been taken care of by VETUS. In addition, these shaft assemblies **protect the environment**: lubrication is ensured by means of raw water, without use of grease or oil. The stern tube is provided with a **dual shaft seal**, eliminating the need for a stuffing box. These propeller shaft assemblies feature a propeller nut with integrated zinc anode as standard supply.

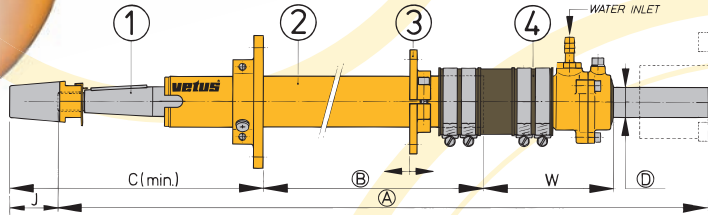


For flexible couplings see page 142 and 143

### WHY SHOULD A PROPELLER SHAFT HAVE A DIAMETER OF Ø 35 MM, IF A Ø 30 MM SHAFT IS MORE THAN ADEQUATE?

All VETUS propeller shaft are made of duplex stainless steel type 1-4462. In comparison with stainless steel materials like AISI 316 and Aquamet 17 or 22, the corrosion resistance of "Duplex 1-4462" is much greater. In addition the tensile strength of "Duplex 1-4462" is about 30% greater than AISI 316 and its hardness is approximately 40% higher. It is precisely this high degree of hardness, which gives "Duplex 1-4462" its excellent running properties in (rubber) bearings.

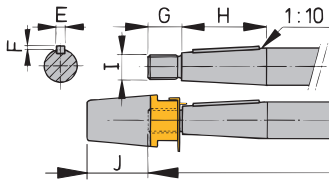
The VETUS (flexible) inner bearing of the system has dual sealing lips, as double water seal against water leakage.



**ALL DIMENSIONS ARE IN MM.**

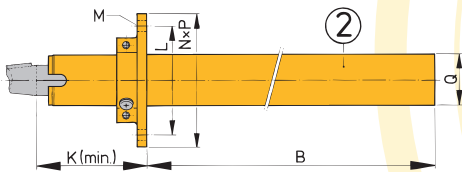
Propeller shaft of Ø 25 and 30 mm					
D	A	B	C	W	
Ø 25			210	112	
Ø 30			267	112	

When ordering, please indicate sizes A, B and D.



One end of a VETUS propeller shaft is machined with a 1:10 taper and a keyway as standard. Also supplied, is a matching key with dimensions according to ISO 4566, a tab washer and a propeller nut with integrated zinc anode. The other end of the shaft may be cut to length.

D	standard length A				E	F	G	H	I	J
Ø 25	1000	1500	2000	2500	8	3	25	55	M16x1,5	40
Ø 30	1000	1500	2000	2500	8	3	30	75	M20x1,5	57



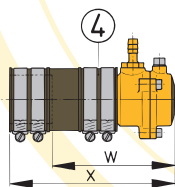
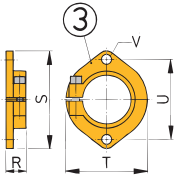
D	standard length B				K	L	M	N	P	Q
Ø 25	500	1000	1500	2000	88	90	Ø 8,5	110	60	Ø 43
Ø 30	500	1000	1500	2000	105	100	Ø 8,5	120	67	Ø 49,5

The rear of the bronze stern tube is provided with an outer cutlass bearing and a mounting flange. The slots in the tube are designed for easy replacement of the cutlass bearing.

D	R	S	T	U	V
Ø 25	18	86	72	70	Ø 8,5
Ø 30	18	90	78	74	Ø 8,5

Mounting flange for stern tube.

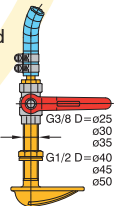
Flexible inner bearing with DUAL lip seal. These inner bearings with dual lip seal are also available to replace older 25 and 30 mm diameter Vetus bearings with a conventional gland packing. A water scoop set should also be installed when making this upgrade.



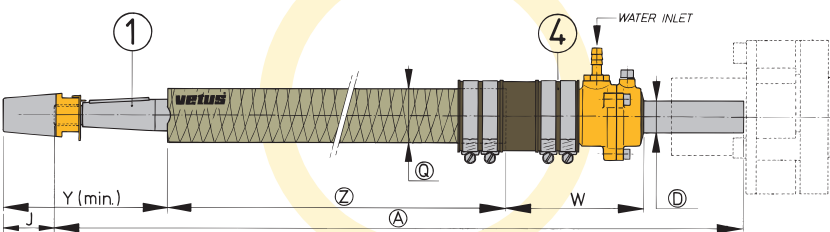
This water-lubricated shaft assembly can, upon request, easily be provided with an additional cutlass bearing, to accommodate longer shafts or higher shaft revolutions.

There are two possibilities of water lubrication for these shaft assemblies:

1. by means of a water scoop G 3/8", with ball valve, hose pillar, 1 m of water hose and hose clamps (optional kit)
2. by tapping a small amount of water from the main engine's raw water cooling circuit.



## PROPELLER SHAFT ASSEMBLIES WITH G.R.P. (POLYESTER) STERN TUBES



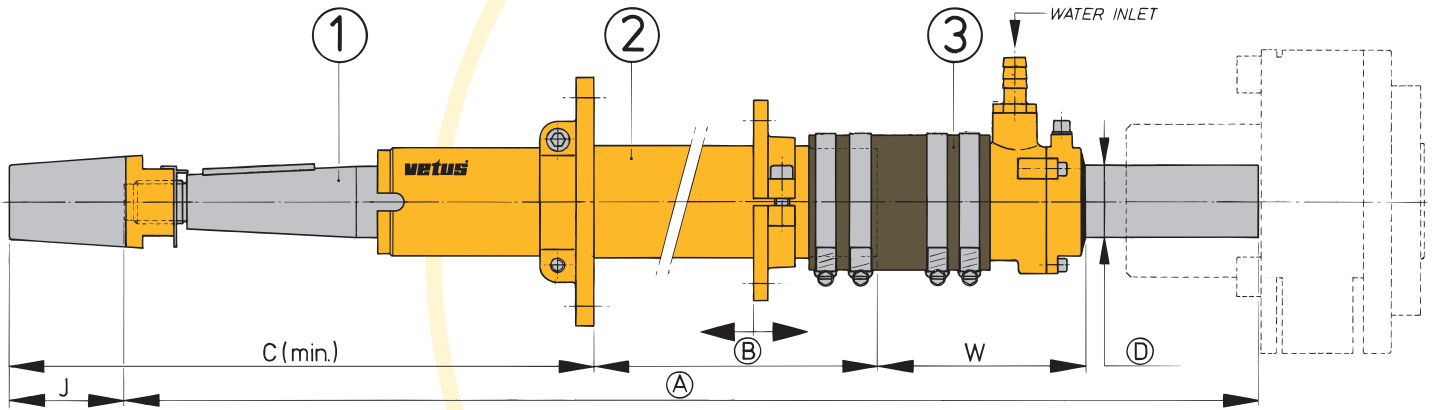
G.R.P. tubes, for 25 or 30 mm diameter shafts, featuring the same **dual shaft seal** as shown above. The shaft tubes, which are provided with a cutlass bearing, must be bonded directly into the hull. A propeller nut with integrated zinc anode comes as standard with the propeller shafts.

D	A	J	Q	W	Y	Z
Ø 25	1000	40	Ø 44	112	127	581.5
	1500					1081.5
Ø 30	1000	57	Ø 50	112	172	595.5
	1500					1095.5
	2000					1595.5

# PROPELLER SHAFT ASSEMBLIES FOR POWERFUL ENGINES (MADE TO ORDER) WITH DUAL SHAFT SEAL FOR SHAFT DIAMETERS OF Ø 35, 40, 45 OR 50 MM.



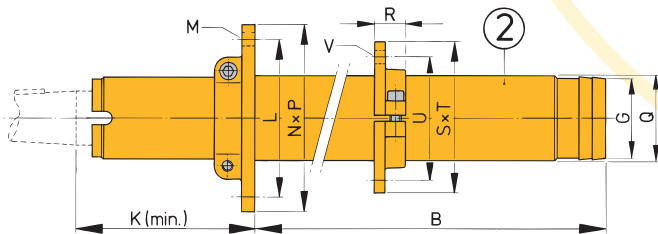
## FOR G.R.P. OR WOODEN VESSELS



All dimensions are in mm

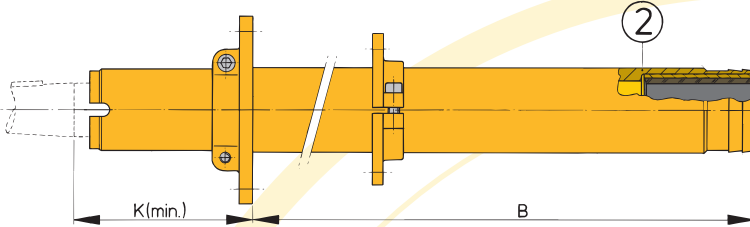
D	A	B	C	J	W
Ø 35			291	54	112
Ø 40			327	64	114
Ø 45			359	69	129
Ø 50			401	79	129

Dependent on length, diameter and number of shaft revolutions, 1, 2 or 3 cutlass bearings must be installed (see table on page 159).

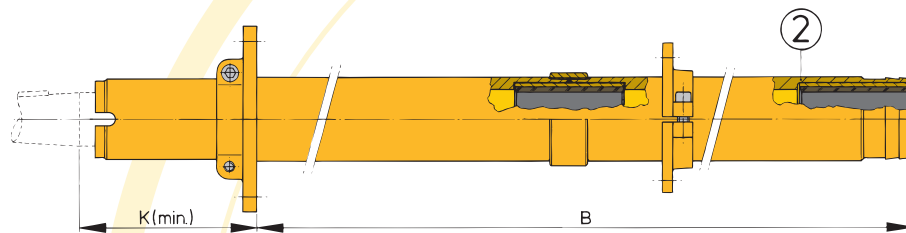


Bronze stern tube with one cutlass bearing, aft.

D	B	G	K	L	M	N	P	Q	R	S	T	U	V
Ø35	on request	Ø56	117	110	Ø10,5	132	76	Ø57	23	112	100	92	Ø10,5
Ø40	on request	Ø61	133	116	Ø10,5	138	82	Ø62	23	116	104	96	Ø10,5
Ø45	on request	Ø71	145	150	Ø13	180	93	Ø72	28	132	122	108	Ø13
Ø50	on request	Ø76	162	165	Ø15	197	99	Ø77	28	138	128	114	Ø13



Bronze stern tube with two cutlass bearings, one forward and one aft.

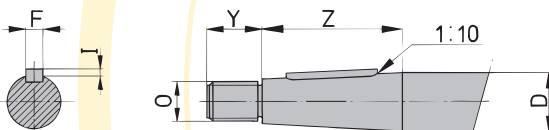


Bronze stern tube with three cutlass bearings (forward, aft and intermediate). When ordering, please specify dimensions A, B and D. The slots in the tube are designed for easy replacement of the cutlass bearing.

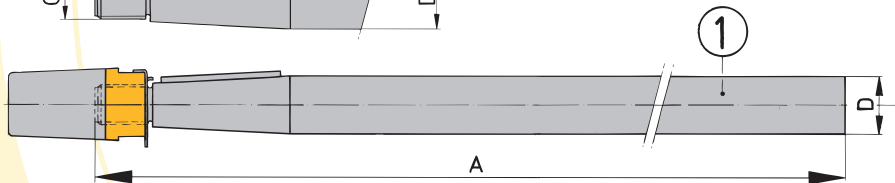
There are two possibilities to provide water lubrication for these shaft assemblies:

1. by means of a water scoop with ball valve, hose pillar, 1 m of water hose and hose clamps (optional kit).
2. by tapping a small amount of water from the main engine's raw water cooling circuit.

G3/8 D = Ø25  
Ø30  
Ø35  
G1/2 D = Ø40  
Ø45  
Ø50



Duplex stainless steel type 1-4462 propeller shaft, completely machined and with propeller nut with integrated zinc anode. Dimensions of taper and keyway in accordance with ISO 4566.

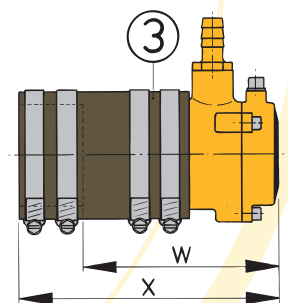


D	Length A	F	I	O	Y	Z
Ø 35	on request	10	3	M24x2	35	85
Ø 40	on request	12	3	M24x2	35	95
Ø 45	on request	14	3,5	M30x2	40	105
Ø 50	on request	14	3,5	M36x3	45	115

D	W	X
Ø 35	112	145
Ø 40	114	150
Ø 45	129	165
Ø 50	129	165
Ø 60	129	168

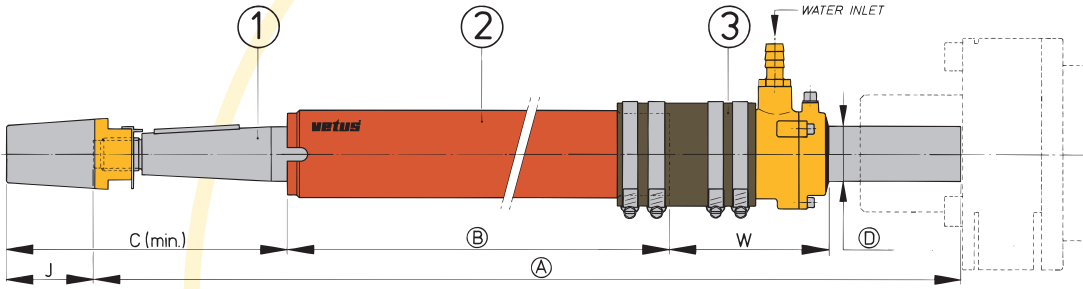
### SELF-ALIGNING INNER BEARING.

The VETUS (flexible) inner bearing used in this system has dual sealing lips, as double security against water leakage.



# PROPELLER SHAFT ASSEMBLIES (MADE TO ORDER) WITH DUAL SHAFT SEAL FOR SHAFT DIAMETERS OF Ø 25, 30, 35, 40, 45 OR 50 MM.

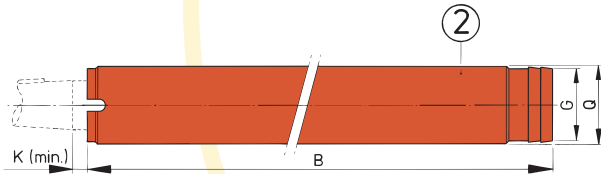
## FOR STEEL VESSELS



All dimensions are in mm

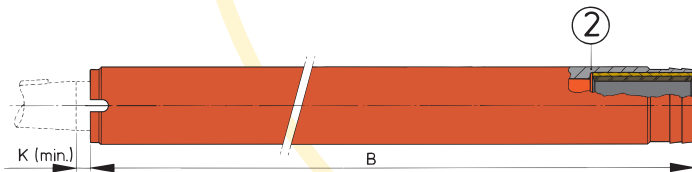
D	A	B	C	J	W
Ø 25			127	40	112
Ø 30			172	57	112
Ø 35			184	54	112
Ø 40			206	64	114
Ø 45			226	69	129
Ø 50			254	79	129

Dependent on length, diameter and number of shaft revolutions, 1, 2 or 3 cutlass bearings must be installed (see table on page 159)

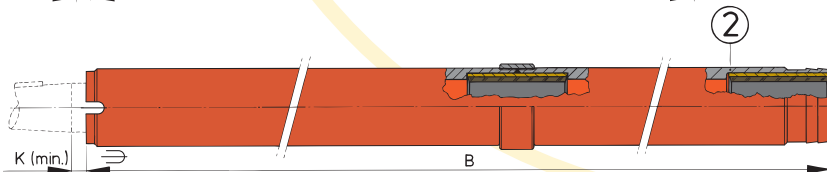


D	B	G	K	Q
Ø 25	on request	Ø 43	8	Ø 51
Ø 30	on request	Ø 49	10	Ø 54
Ø 35	on request	Ø 56	10	Ø 60
Ø 40	on request	Ø 61	12	Ø 63,5
Ø 45	on request	Ø 71	12	Ø 70
Ø 50	on request	Ø 76	15	Ø 76

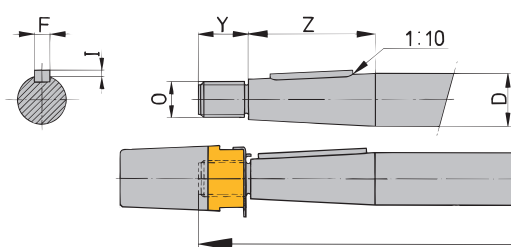
Steel stern tube with one cutlass bearing, aft.



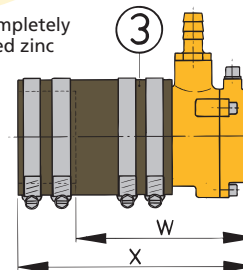
Steel stern tube with two cutlass bearings, one forward and one aft.



Steel stern tube with three cutlass bearings (forward, aft and intermediate). When ordering, please specify dimensions A, B and D. The slots in the tube are designed for easy replacement of the cutlass bearing.



Duplex stainless steel 1-4462 propeller shaft, completely machined and with propeller nut with integrated zinc anode. The dimensions of the taper and the keyway are machined according to ISO 4566.



### Self-aligning inner bearing.

The VETUS flexible inner bearing used in this system has dual sealing lips, as double security against water leakage.

There are two possibilities to provide water lubrication for these shaft assemblies:

- by means of a water scoop with ball valve, hose pillar, 1 m of water hose and hose clamps (optional kit).
- by tapping a small amount of water from the main engine's raw water cooling circuit.

D	Length A	F	I	O	Y	Z
Ø 25	on request	8	3	M16x1.5	25	55
Ø 30	on request	8	3	M20x1.5	30	75
Ø 35	on request	10	3	M24x2	35	85
Ø 40	on request	12	3	M24x2	35	95
Ø 45	on request	14	3,5	M30x2	40	105
Ø 50	on request	14	3,5	M36x3	45	115

D	W	X
Ø 25	112	144
Ø 30	112	144
Ø 35	112	145
Ø 40	114	150
Ø 45	129	165
Ø 50	129	165
Ø 60	129	168

### VETUS water lubricated cutlass bearings (with brass or phenolic shell)

Available for shaft diameters between Ø 20 mm and Ø 100 mm and from Ø 1" through Ø 4". Polyurethane-rubber lining. Outer bushings made of either brass or phenolic resin. Phenolic resin is lighter in weight, cannot corrode and may be replaced very easily. Ideally suited for use in aluminium boats.

VETUS rubber bearings are, upon request, also available for larger shaft diameters.

For shafts with diameter in mm and stern tubes with inside diameters in inches.

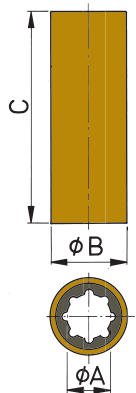
For shafts with diameter in mm and stern tubes with inside diameter in mm.

For shafts with diameters in inches and stern tubes with inside diameters in inches.

A	B	C
20 mm*	1 1/8"	75 mm
22 mm*	1 1/4"	75 mm
25 mm	1 1/2"	100 mm
30 mm	1 3/4"	120 mm
35 mm	1 7/8"	140 mm
40 mm	2 1/8"	160 mm
45 mm	2 3/8"	180 mm
50 mm	2 5/8"	200 mm
55 mm*	2 7/8"	220 mm
60 mm	3"	240 mm
65 mm*	3 1/4"	240 mm
70 mm	4"	300 mm
80 mm	4"	320 mm

A	B	C
25 mm	40 mm	100 mm
30 mm	45 mm	120 mm
35 mm	50 mm	140 mm
40 mm	55 mm	160 mm
45 mm	65 mm	180 mm
50 mm	70 mm	200 mm
60 mm	80 mm	240 mm
70 mm	90 mm	280 mm
80 mm	100 mm	320 mm
90 mm	110 mm	360 mm
100 mm	125 mm	400 mm

A	B	C
1"	1 1/2"	4"
1 1/8"	1 3/8"	4 1/2"
1 1/4"	1 3/4"	5"
1 3/8"	1 7/8"	5 1/2"
1 1/2"	2"	6"
1 5/8"	2 1/8"	6 1/2"
1 3/4"	2 3/8"	7"
2"	2 5/8"	8"
2 1/4"	3"	9"
2 1/2"	3 1/4"	10"
2 3/4"	3 1/2"	11"
3"	4"	12"
3 1/2"	4 1/2"	14"
4"	5"	16"

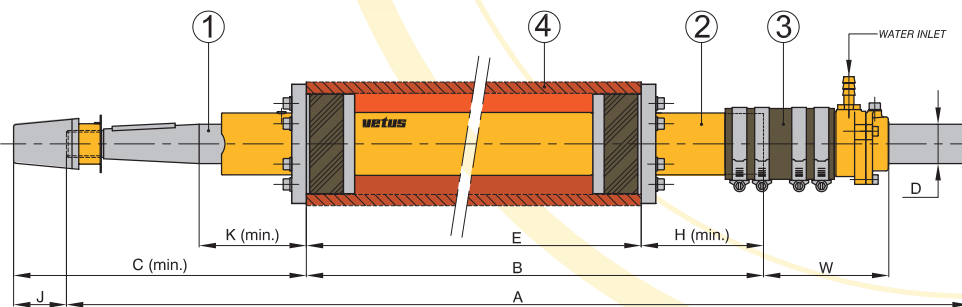
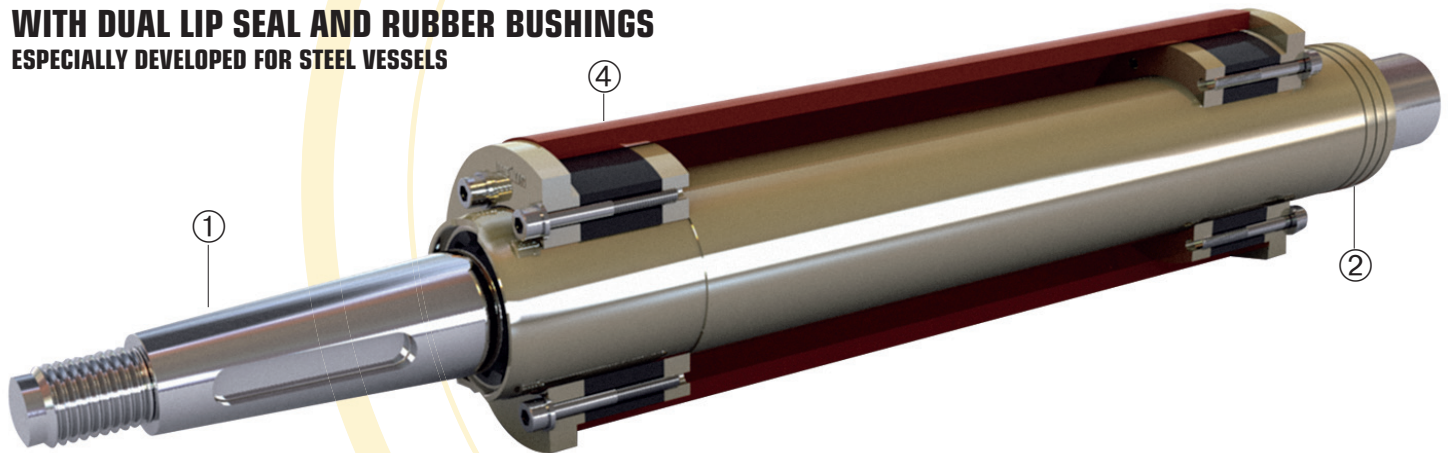


\* Available by special order.

# PROPELLER SHAFT ASSEMBLIES FOR POWERFUL ENGINES (MADE TO ORDER) FOR PROPELLER SHAFTS OF Ø 35, 40, 45 OR 50 MM.



## WITH DUAL LIP SEAL AND RUBBER BUSHINGS ESPECIALLY DEVELOPED FOR STEEL VESSELS

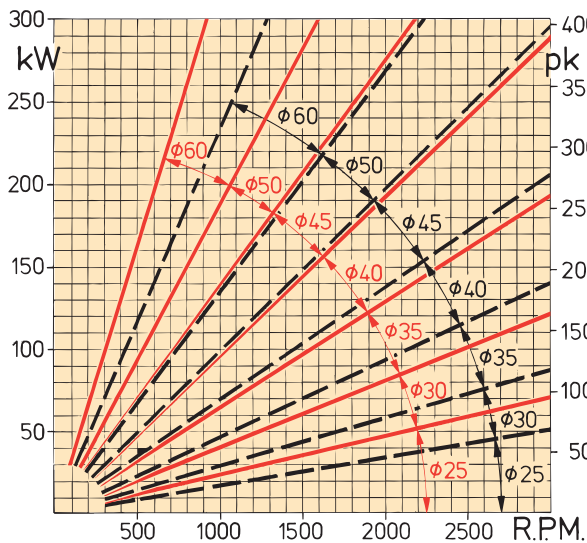


D	A	B	C	E	H	J	K	W	Precision steel tube
Ø35	on request	on request	291	on request	60	54	117	112	I.D. = 90
Ø40	on request	on request	327	on request	63	64	133	114	I.D. = 90
Ø45	on request	on request	359	on request	63	69	145	129	I.D. = 115
Ø50	on request	on request	401	on request	63	79	162	129	I.D. = 115

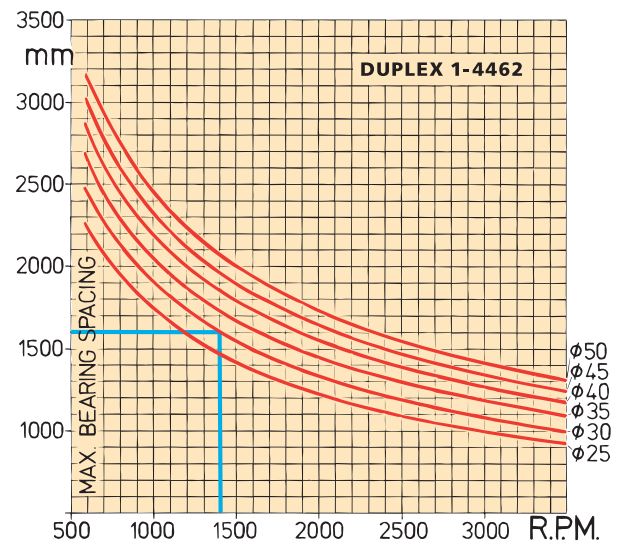
This water-lubricated propeller shaft assembly uses a thick walled steel outer tube, which can be welded into a steel boat with minimum distortion. In this steel tube a VETUS bronze stern tube can be easily fitted with the aid of the rubber bushings. The bronze stern tube is supplied as standard with one rear cutlass bearing, but additional cutlass bearings (intermediate and/or forward) can be supplied upon request at extra cost. Please see drawing. The bronze inner tube can be supplied with a VETUS self-aligning inner bearing with dual lip seal, type ZWB. When ordering, please state dimensions A, B, D and E. Although the inside of the steel tube will not come into contact with water, the assembly is provided with a corrosion resistant coating, to provide additional protection.

### DUPLEX 1-4462

### AISI 316



### DUPLEX 1-4462



### MATERIAL OF VETUS PROPELLER SHAFTS

All VETUS propeller shaft are made of stainless steel type "Duplex 1- 4462". In comparison with stainless steel materials like AISI 316 and Aquamet 17 or 22, the corrosion resistance of "Duplex 1-4462" is much greater. In addition the tensile strength of "Duplex 1-4462" is about 30% greater than AISI 316 and its hardness is approximately 40% higher. It is precisely this high degree of hardness, which gives "Duplex 1-4462" its excellent running properties in (rubber) bearings.

Dependent on length, diameter and number of shaft revolutions, 1, 2 or 3 cutlass bearings must be installed

### Example

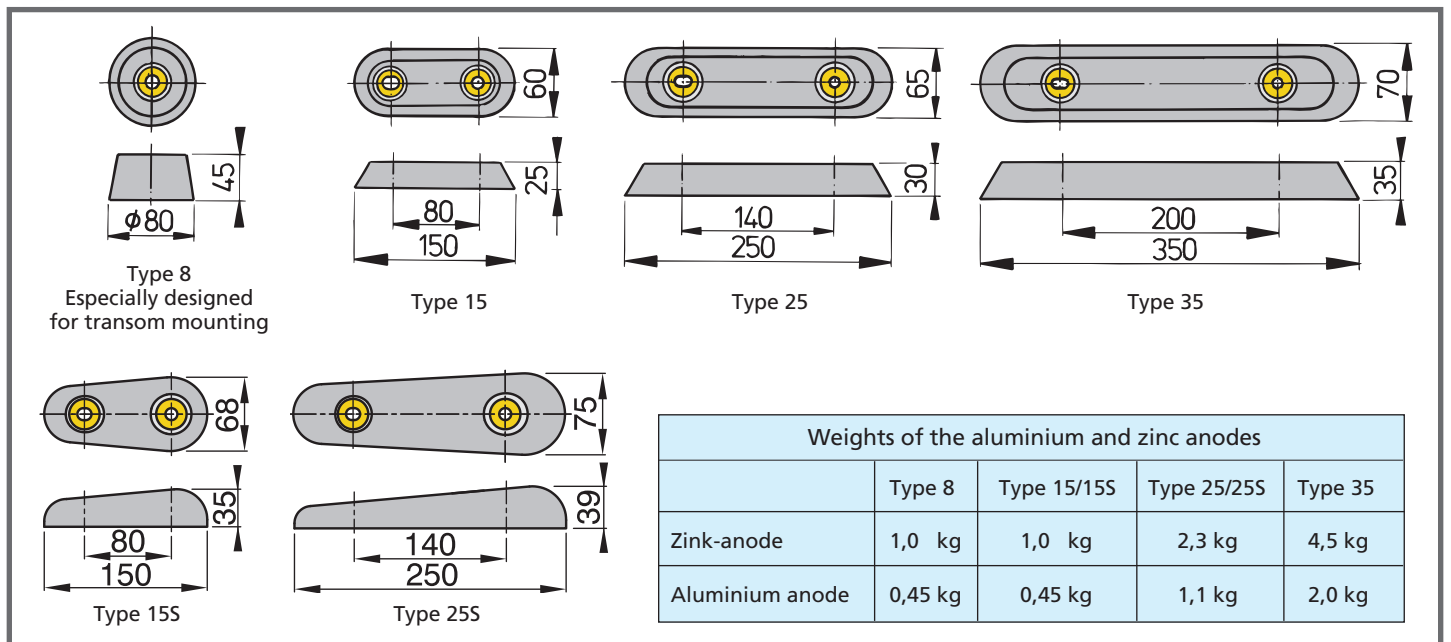
Imagine, you have a shaft with a maximum shaft speed of 1400 r.p.m. and a diameter of 30 mm. The diagram shows (blue line) that the maximum distance between 2 bearings amounts to 1600 mm. If you have a shaft of e.g. 1500 mm. length, then one rubber bearing will be sufficient. Should you have a shaft of 2000 mm. length, in this case 2 rubber bearings have to be used. For shafts with a length of 3200 mm or longer use 3 bearings.

**In view of the fact that the material of VETUS propeller shafts is much stronger, smaller shaft diameters will generally suffice.**



## WHEN TO APPLY ZINC ANODES AND WHEN THE ALUMINIUM MODELS?

For vessels, which mostly cruise on **inland (fresh)** waters, we recommend **aluminium** anodes, since aluminium has a greater difference of potential with other metals than zinc. This is very important, as fresh water provides a higher electrical resistance than salt water. For sailing on **salt waters** we recommend the use of **zinc** anodes. Although aluminium anodes would perform a perfect job at sea as well, they would be sacrificed much more quickly. We do not recommend the use of **magnesium** anodes, as the difference of potential with other metals is too great, which could cause damage to the hull paint, especially when sailing in brackish or salt waters.



Directives for the protection of steel hulls:

Exposed surface protected per anode, both aluminium and zinc.			
Type	Adequate paint system	Worn out paint	Unpainted bare
8	12 m <sup>2</sup>	6 m <sup>2</sup>	3,5 m <sup>2</sup>
15/15S	14 m <sup>2</sup>	7 m <sup>2</sup>	3,5 m <sup>2</sup>
25/25S	24 m <sup>2</sup>	12 m <sup>2</sup>	6,5 m <sup>2</sup>
35	40 m <sup>2</sup>	20 m <sup>2</sup>	10,5 m <sup>2</sup>

Cathodic protection by means of anodes is a "must" for the protection of all metal parts under water. Therefore, not only for steel boats, but also for wooden, fibreglass and aluminium hulls, anodes are required. The material of the VETUS zinc anodes is of the highest possible standard, the U.S. mil.-A-18001 J. specifications. Anodes which do not meet these specifications have hardly any effect or no effect at all. VETUS aluminium anodes consist of an aluminium-indium-zinc alloy. All VETUS anodes are streamlined and mounted either with specially made studs, which can be welded to a steel hull, or special through-hull bolts for fibreglass and wooden boats.

**We supply these studs and bolts separately.**

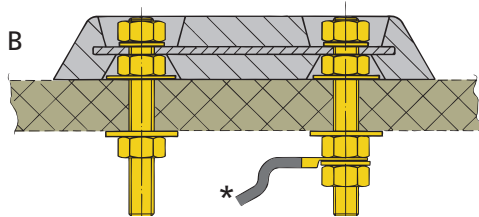
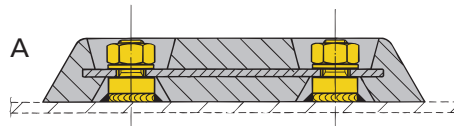
When ordering, please always specify the material of the hull. All metal parts must have a direct contact with the anode. Therefore the bolts supplied for e.g. fibreglass hulls must have a wire-connection, so that contact can be made with the metal parts. (See drawing B). On fibreglass and wooden boats only the **metal** parts must be protected. For anodes type 8 you need **one** (1) connection kit and for types 15, 15S, 25, 25S and 35 you need **two** (2) of these. All VETUS anodes have a protective layer of paint at the mounting side to prevent damage to the paint work of your boat.

### HOW TO INSTALL WELD-ON STUDS FOR STEEL HULLS

Anodes that are installed by means of studs are much easier to replace than anodes that are welded directly to the ship's hull.

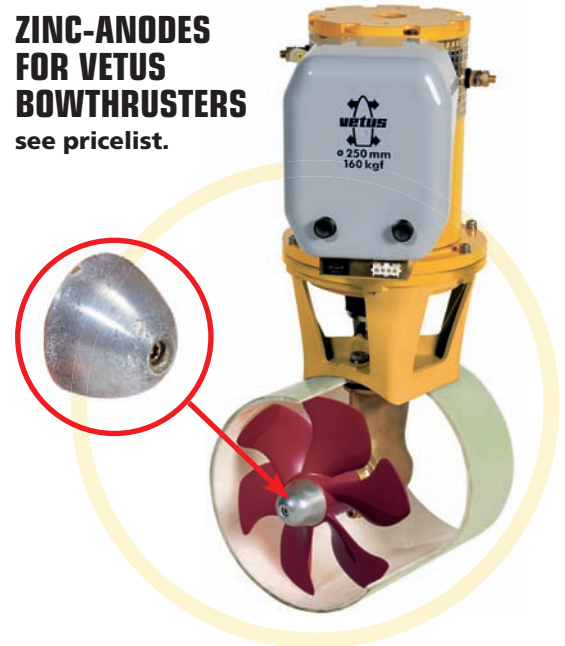
For fibreglass and wooden hulls.

\* Copper wire to connect parts to be protected.



### ZINC-ANODES FOR VETUS BOWTHRUSTERS

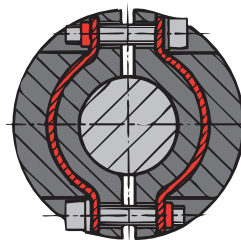
see pricelist.



### SHAFT ANODES, FOR INSTALLATION DIRECTLY TO THE PROPELLER SHAFT

These VETUS shaft anodes are provided with cast-in metal clamps, which ensure longer life of the anode, prevent early loss of material and give a firm grip onto the shaft.

For high speed vessels, we advise against the use of shaft anodes. They offer considerable resistance and, when partly sacrificed, will cause an undesirable unbalance of the propeller shaft. In this case, please use the VETUS propeller nut with integrated zinc anode.



Type	Shaft diameter	Anode diameter	Length	Weight
D 25	25 mm	55 mm	65 mm	0,7 kg
D 30	30 mm	55 mm	65 mm	0,65 kg
D 35	35 mm	70 mm	77 mm	1,2 kg
D 40	40 mm	70 mm	77 mm	1,0 kg
D 45	45 mm	85 mm	98 mm	2,6 kg
D 50	50 mm	85 mm	98 mm	2,3 kg
D 60	60 mm	85 mm	98 mm	1,8 kg

Type	Shaft diameter	Anode diameter	Length	Weight
D 1"	1"	55 mm	66 mm	0,7 kg
D 1 1/4"	1.25"	70 mm	78 mm	1,2 kg
D 1 1/2"	1.5"	70 mm	78 mm	1,1 kg
D 1 3/4"	1.75"	85 mm	100 mm	2,6 kg
D 2"	2"	85 mm	100 mm	2,3 kg

## SOUND DEADENING PLATE, TYPE SDP

Fulfils the requirements of the ISO 4589 standard.



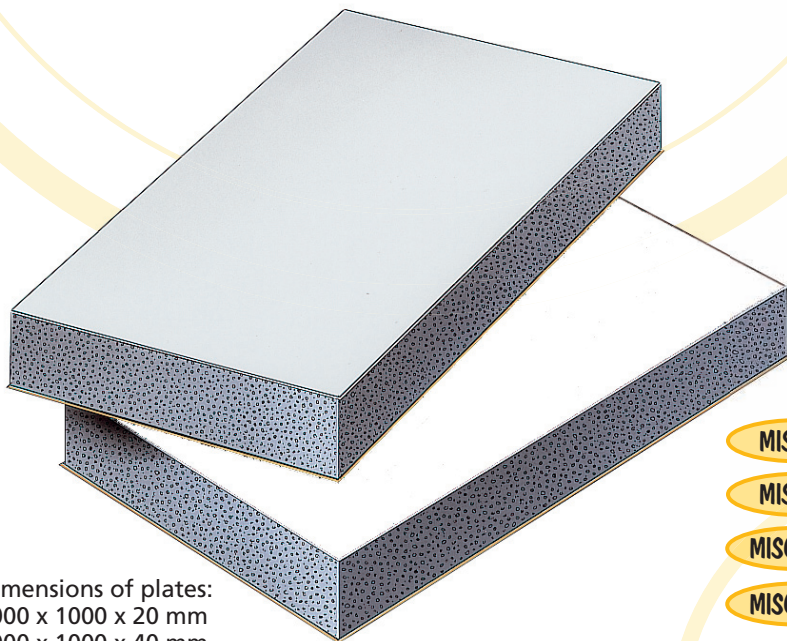
SDP14X10

Dimensions of plates: SDP 14 x 10: Perforated vinyl top layer, 1380 x 1000 x 36 mm weight: 11,5 kg/sheet. Temperature proof from: -30°C to +90°C.

VETUS SDP plates both absorb the noise and insulate the vibrations. The structure of this plate is formed by two polyurethane foam layers, one of 5 mm and the other of 25 mm thickness. Between those two layers, an anti-reverberation slab of 4 mm thickness is located. The two layers of foam result in noise absorption, whereas the anti-reverberation plate eliminates vibrations. Without this type of construction, it would be impossible to achieve the optimum sound insulation.

## SOUND INSULATING PLATES, TYPE MISO

Available with surface skin in grey or white colour and with a thickness of 20 or 40 mm. The white version gives the engine room a brighter and more spacious aspect.



MISO100

MISO140

MISO100W

MISO140W

Dimensions of plates:  
1000 x 1000 x 20 mm  
1000 x 1000 x 40 mm

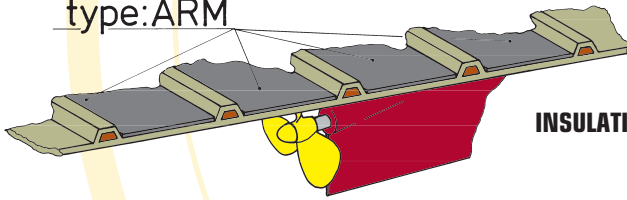
This material provides sound absorption but does not eliminate vibrations. The reverse side of the plate is self-adhesive. The material consists of a flexible, closed cell top layer (no oil absorption). Insulating plates with a so-called "egg-box" profile have definitely no better sound-deadening capacities than these flat MISO-plates.

## NOISE CONTROL ON BOARD

Many a yacht skipper and his crew have to endure a level of noise and vibration which would be totally unacceptable elsewhere. Yet a noise level of 65 to 70 dB is easily achieved by the use of proper sound deadening materials. As a comparison; the noise level of an idling petrol engine equals 70 dB. Unwanted noises are either structure borne sounds or air transmission sounds. On board boats, the engine(s) and the propeller(s) are the prime sources of unwanted noise. The air transmission noises of a marine engine are chiefly related to the number of revolutions. The more an engine is "revved-up", the higher the noise level. These noises may be reduced effectively by application of the sound-deadening plates, model SDP to the engine room walls and ceiling. The special construction of these plates, with two layers of foam and a heavy slab in between (contains no lead), provides very good insulation from vibration as well as excellent noise absorption.

The sound insulation plates type MISO have a much simpler construction than the SDP type. MISO plates only provide noise absorption. The vibrations of the ship's engine are transmitted to the vessel, through the engine bed. This specific noise belongs to the category of "structurally borne sounds". Effective countermeasures against such vibrations are the installation of correct flexible engine mountings and - first and foremost - the flexible connection of the various metal pipes of the engine. It is indeed of little use to provide a well-insulated engine installation if no attention is paid to the noise, produced by the propeller. Cavitation transmitted to the bottom of the boat through the water may cause appreciable reverberation, resulting in an additional amount of unwanted noise. This specific variety of "noise" may be eliminated in an excellent way by application of the VETUS "Anti-Reverberation-Material", type ARM. This material comes as a compound and is to be applied to the inside of the hull, where the propeller is located.

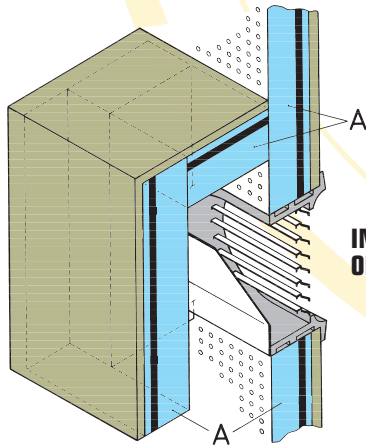
type:ARM



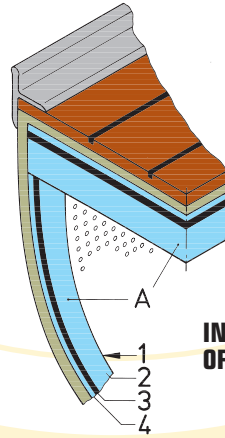
**INSULATION DETAIL OF THE BILGE**

**INSULATION DETAIL OF A BOAT HULL AND DECKHEAD**

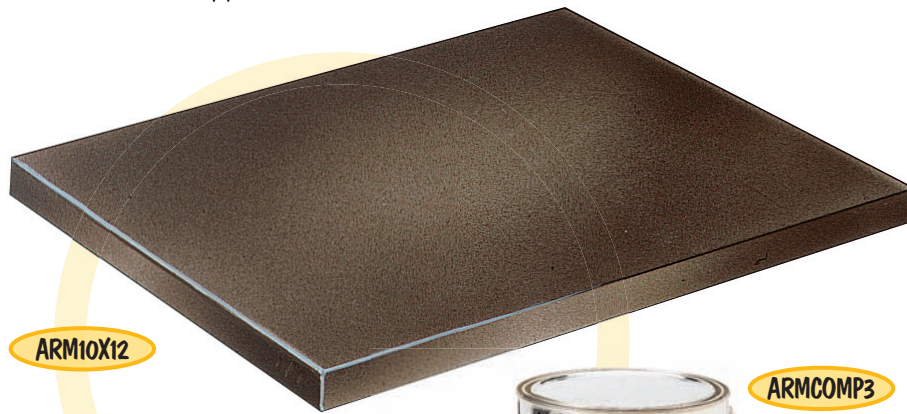
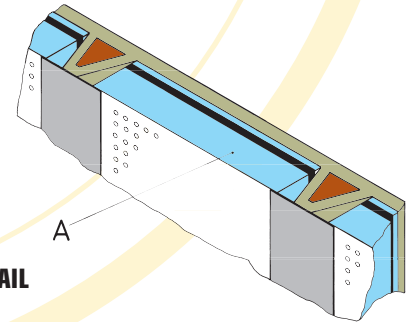
- A : VETUS sound-deadening plate type SDP  
 1 : 2 mm perforated vinyl top layer,  
 2 : polyurethane foam layer, 25 mm thickness  
 3 : anti-reverberation slab, 4 mm thickness  
 4 : polyurethane foam layer, 5 mm thickness



**INSULATION DETAIL OF AN AIR DUCT**



**INSULATION DETAIL OF A PARTITION**



**ANTI-REVERBERATION MATERIAL, TYPE ARM**

This VETUS plate or compound type ARM specifically reduces the structure borne sounds, e.g. caused by the ship's propeller. For best results, the thickness of the compound layer should be 2.5 times the thickness of the ship's bottom.  
 Nett weight of compound: 1 or 3 kg.  
 Specific weight of dry compound: 1.1.  
 Temperature proof from -10° to +90°C.  
 Nett weight plate: 8 kg (1000x1200x4mm thick). Suitable for steel and aluminium.

ARM10X12

ARMCOMP3



ARMCOMP1

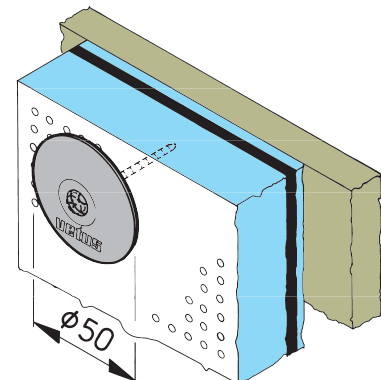
Practical tests demonstrate that this material can help to reduce bow thruster noise. A coat of ARM compound, or a layer of sheet material around the tunnel can reduce the sound level by about 3 dB(A). Two layers can create a reduction of up to 7 dB(A).

Ceiling Rose for easy installation of sound-deadening plates.



FIXP

Material: polypropylene



**VETUS POLY-WOOD sheet material is made of high-density polyethylene and is UV-stabilized. This material is excellently suited for the fabrication of all sorts of components on board boats. It is completely resistant against sunlight and water and tough and durable at that. Fabrication is done with common woodworking machinery and tools.**

It is a solid, non-laminated poly-wood, which will never be subject to delamination. In view of the fact that the sheets need not be sanded, veneered or painted, the saving in labour cost will prove to be enormous.

## THE MOST SPECTACULAR INVENTION SINCE G.R.P.

Code	<b>POLY-WOOD White RAL 9010</b>	Weight
SH06WS	Poly-wood sheet, white, 1220 mm x 800 mm x 6 mm	6 kg
SH12WS	Poly-wood sheet, white, 1220 mm x 800 mm x 12 mm	11 kg
SH18WS	Poly-wood sheet, white, 1220 mm x 800 mm x 18 mm	17 kg

Code	<b>POLY-WOOD White RAL 9010</b>	Weight
SH06W	Poly-wood sheet, white, 1220 mm x 2440 mm x 6 mm	17 kg
SH12W	Poly-wood sheet, white, 1220 mm x 2440 mm x 12 mm	34 kg
SH18W	Poly-wood sheet, white, 1220 mm x 2440 mm x 18 mm	51 kg

Code	<b>POLY-WOOD Beige RAL 1015</b>	Weight
SH06I	Poly-wood sheet, beige, 1220 mm x 2440 mm x 6 mm	17 kg
SH12I	Poly-wood sheet, beige, 1220 mm x 2440 mm x 12 mm	34 kg
SH18I	Poly-wood sheet, beige, 1220 mm x 2440 mm x 18 mm	51 kg

Code	<b>POLY-WOOD Grey RAL 7047</b>	Weight
SH06G	Poly-wood sheet, grey, 1220 mm x 2440 mm x 6 mm	17 kg
SH12G	Poly-wood sheet, grey, 1220 mm x 2440 mm x 12 mm	34 kg
SH18G	Poly-wood sheet, grey, 1220 mm x 2440 mm x 18 mm	51 kg

Code	<b>POLY-WOOD Light RAL 9010</b>	Weight
SH12WL	Poly-wood sheet, white, 1220 mm x 2440 mm x 12 mm thickness	25 kg
SH18WL	Poly-wood sheet, white, 1220 mm x 2440 mm x 18 mm thickness	37,5 kg

## EACH SHEET IS PROTECTED BY A PLASTIC MASKING. WE RECOMMEND THAT YOU REMOVE THE MASKING WHEN THE JOB IS DONE; NOT BEFORE

### MACHINING

VETUS POLY-WOOD sheets for boatbuilding purposes are easier to machine than wood, with the aid of common woodworking machinery or handtools. The wear and tear on the tools is much less, compared to working with wood. Shaping the polymer into curved surfaces is much easier than in woodworking. Both face surfaces have an integrated texture, to prevent damage by scuffing or scraping.

### STAINS

The unique formula of VETUS POLY-WOOD resists almost every form of staining, especially the ones resulting from severe marine conditions. However, teak oil and a common pencil will leave their marks.

### PAINTING

We advise against painting VETUS POLY-WOOD. In spite of claims by various paint manufacturers, painting is not recommended.

### HOW TO USE

The VETUS POLY-WOOD cannot rot, splinter, crack open or show discolouration; it is therefore also very suitable for **outside** applications, resisting the influence of the worst weather conditions. Moreover, the material can resist **temperatures of up to 70°C** and is therefore excellently suitable for use in engine rooms, etc.

### CONNECTIONS AND FASTENING

VETUS POLY-WOOD may have different expansion and contraction properties than other materials (e.g. wood). It is therefore recommended to drill oversized holes for the fastening bolts or screws. This is especially important in the vicinity of e.g. cookers and in the engine room. According to standard woodworking practice, any screw holes can be neatly plugged, making good use of the sheet's off-cuts.

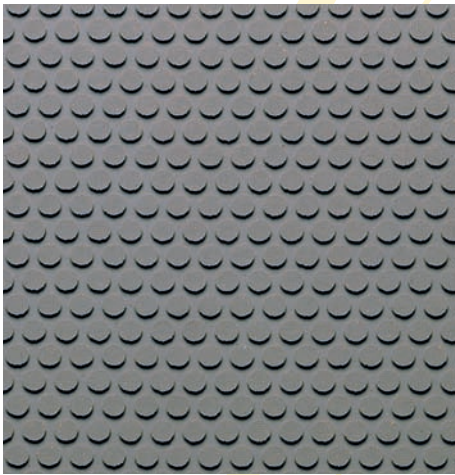
### GLUES

Almost no conventional glue sticks to VETUS POLY-WOOD sheets. That is one of the

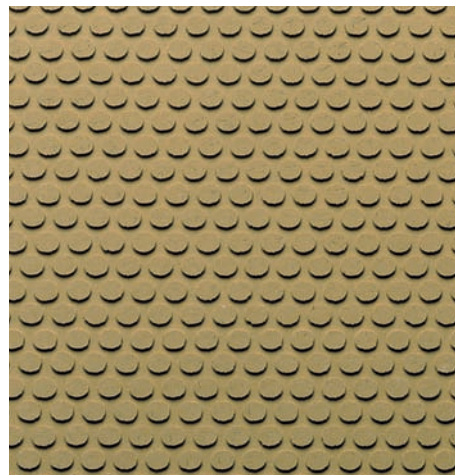
reasons why it is so resistant against stains and discolouration and why it can be cleaned so easily. For bonding of VETUS POLY-WOOD we recommend 3M Scotch-Weld™ DP 8005. For further information please visit their website [www.3m.com/bonding](http://www.3m.com/bonding).



**NON-SLIP DECK COVERING** |



Happy Elephant



Safari

Deck covering, made of rubber, cork and plastic. This material has incredibly high non-slip properties under all circumstances. It is highly resistant against sunlight, seawater and oil. Suitable for all types of decks (steel, glassfibre, wood, aluminium and concrete).

Sheet sizes:  
90 x 120 cm  
90 x 240 cm



**VETUS FIX**

This glue has been specially developed to bond VETUS non-slip deck covering. However, it is also very suitable for bonding P.V.C.- and polyester foil to leather and wood. Excellent adhesion is obtained as well on laminated plastics such as Formica, hard P.V.C. and ABS. Supplied in 1 litre can. 1 litre VETUS FIX is sufficient to glue 2 to 3 m<sup>2</sup>.



**BOATFIXI**

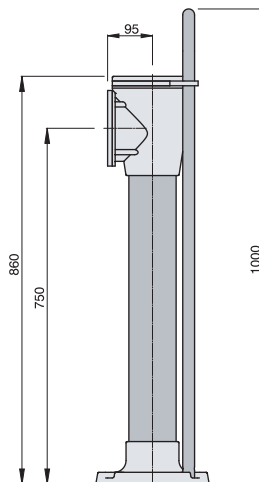
**STEERING COLUMN**

This VETUS steering column is entirely made of anodized aluminium and finished with a white polyurethane coating. A crash bar, made of polished stainless steel, and fixing ring are available as optional equipment. Dimensions: Base 240 x 240 mm. Weight: only 4.6 kg.

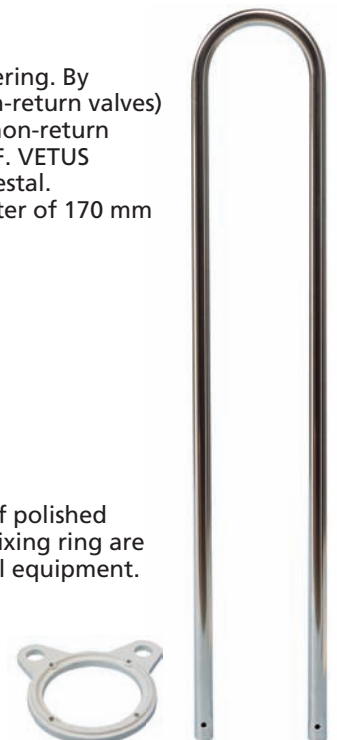
A plain drilled flange is supplied for installation of most types of steering. By removing the flange, VETUS type MTP hydraulic pumps (without non-return valves) can be fitted directly. VETUS type HTP and HTPR (with and without non-return valves) can be installed using the optional stainless steel flange, HTPF. VETUS pumps type MTP with non-return valves cannot be fitted to this pedestal. On the top of the column, a compass with a maximum flange diameter of 170 mm can be installed.



**STUURPEN**



A crash bar, made of polished stainless steel, and fixing ring are available as optional equipment.

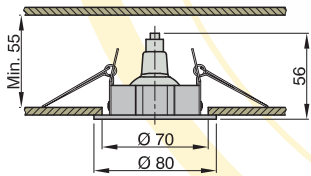


**VETUS V-LINE.**

**Light fixtures of rare beauty**

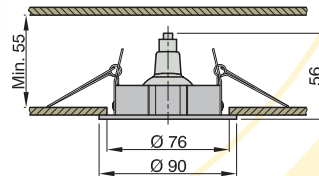
V-Line is a newly developed range of interior lights with eye-catching good looks, for the saloon, galley, cabin and heads. The fittings are all made of hand-polished and anodised aluminium. The beige stripe ensures that all models coordinate with one another, to create the perfect finishing touch to any boat's interior. The halogen bulbs for these light fittings must be ordered separately.

**LUCCA (FIXED)**



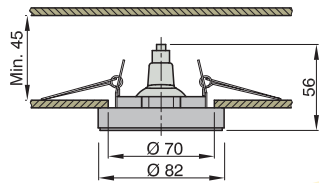
**LUCCA**

**PISA (ROTATING)**



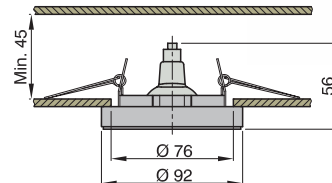
**PISA**

**LIMITE (FIXED)**



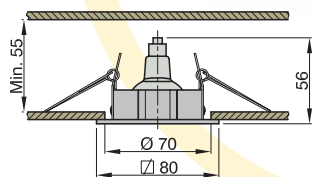
**LIMITE**

**EMPOLI (ROTATING)**



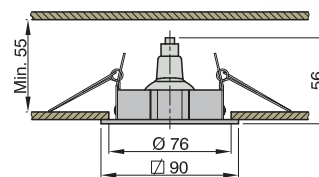
**EMPOLI**

**PRATO (FIXED)**



**PRATO**

**VINCI (ROTATING)**



**VINCI**

Although there are no current CE standards for interior lighting on pleasure craft, all VETUS halogen lights comply with the standards set for domestic lighting (CE/ENEC). All VETUS V-line light fittings are designed for an enclosed reflector halogen bulb. It is impossible for the bulb to vibrate loose whilst underway and replacement is very simple. The connection cables are heat resistant and double insulated.



**LIVORNO**  
(INCLUDING SWITCH)

**LIVORNO**

**SIENA (INCLUDING SWITCH)**

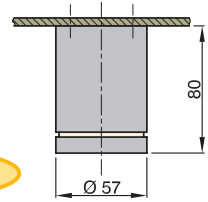
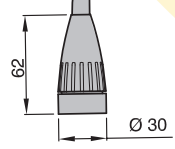


**SIENA**

**FIRENZE (SURFACE MOUNT)**

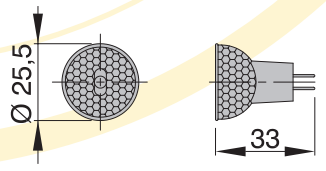


**FIRENZE**



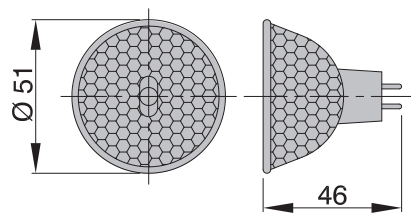
**MR 8**

Halogen bulb for Siena and Livorno  
 Output: 20 W  
 Voltage: 12 or 24 Volt  
 Diameter: 25.5 mm



**MR 16**

Halogen bulb for Lucca, Pisa, Limite, Empoli, Prato, Vinci and Firenze  
 Output: 10 or 20 W  
 Voltage: 12 or 24 Volt  
 Diameter: 51 mm



**SWS**

On/off switch for all halogen lights  
 Dimensions: 60 x 60 mm.  
 Built-in depth: 12 mm

**DS1224**

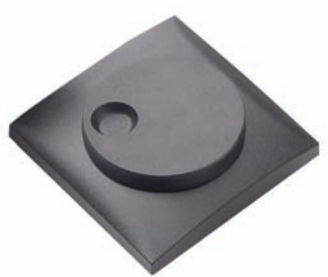
Dimmer for halogen lighting.  
 Maximum rating: 80 W at 12 Volt or 160 W at 24 Volt.  
 Dimensions: 60 x 60 mm  
 Built-in depth: 22 mm

**DIM1224**

Separate dimmer module. May be used with DIMS1224 or any other suitable switch. It is also possible to create two-way switching with the aid of this dimmer module  
 Maximum rating: 80 W at 12 Volt or 160 W at 24 Volt.  
 Dimensions: 70 x 60 x 25 mm

**DIMS1224**

Pulse switch to operate the separate dimmer module (DIM1224)  
 Dimensions: 60 x 60 mm  
 Built-in depth: 22 mm







At night, a VETUS underwater spotlight provides a brilliant and enchanting effect in the water around your boat. With more than one spot, the effect is even more spectacular. Naturally, these VETUS spotlights are made of a high-grade stainless steel type AISI 316 and provided with a wide angle borosilicate lens for optimum light dissipation. All spotlights are provided with internal overheat protection and installation is very simple. The fitting method is similar to that of a skin fitting and the large flange ensures a perfect watertight installation. The cable and the matching plugs are supplied as standard. The hole diameter is 58 mm (2 1/4").

**THERE ARE SEVERAL MODELS AVAILABLE:**

**USP1220**

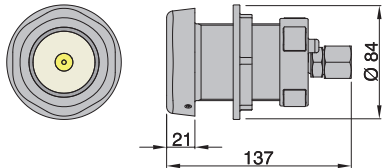
20 Watt halogen bulb  
 12 Volt

**USP2420**

20 Watt halogen bulb  
 24 Volt

**USP1220X**

20 Watt Xenon bulb  
 12 Volt



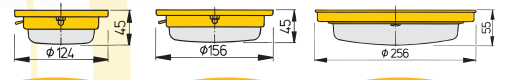
**CEILING LIGHTS (12/24 VOLT)**

The YOLANDA ceiling lights are made of **brass** or **aluminium**. There is a choice of 3 different sizes and 2 different finishes. The built-in mirror reflectors provide 30% more light output. **The models 120 and 150 are provided with a on/off switch. Model 250 is not.**



The Yolanda 120 and 150 are made to receive two festoon bulbs of 10 Watt each and feature a mini-switch. Model 250 is made to receive maximum 4 festoon bulbs of 10 Watt each (no switch).

Three different sizes are available



Made of high-gloss polished brass, protected by a transparent enamel coating (do not polish).

**YOL120M**

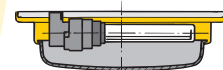
**YOL150M**

**YOL250M**

**YOLW**



**YOL150MR**



**PL150**



**PL**

Made of aluminium, enamelled white. Two different sizes are available: 120 and 150 mm.

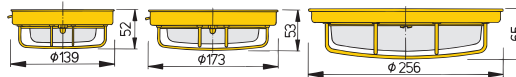
At night, a ceiling light with a **red lens** is ideally suited for providing a cabin light without impairing night vision.

PL-tubes consume about 1/5 of the **energy** that conventional light bulbs require. Of course, this is very important on board boats. Model PL Yolanda 150 is made to receive a 5 Watt PL-tube.

**CEILING LIGHTS (12/24 VOLT)**



The **Domenica ceiling** lights are made of high-gloss polished brass, protected with a transparent enamel coating (do not polish).



**DOM135**      **DOM170**      **DOM245**

The models **Domenica 135** and **170** are provided with a mini-switch and are made to receive 2 festoon bulbs of 10 Watt each. Model **Domenica 245** has no switch and may receive up to 4 festoon bulbs of 10 Watt each.



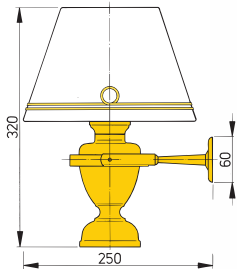
**READING LIGHTS (12/24 VOLT)**

All visible metal parts of these VETUS reading lights are made of high-gloss polished brass, with clear enamel coating (do not polish). Suitable for a B15 conventional bulb. We can supply these bulbs for 12 or 24 Volt D.C. electric installations and in 10, 15 or 20 Watt. With the exception of the model Gimsea, all bulkhead/reading lights shown below are provided with an on/off switch.

**GIMSEA**

Gimbal construction.

**GIMSEAB**



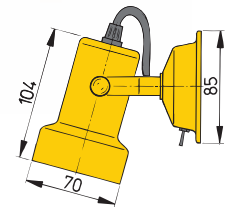
**FINCH**

(with or without anchor). Rotates through 360°.

**FINCHM**



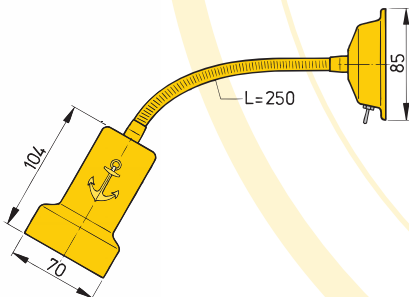
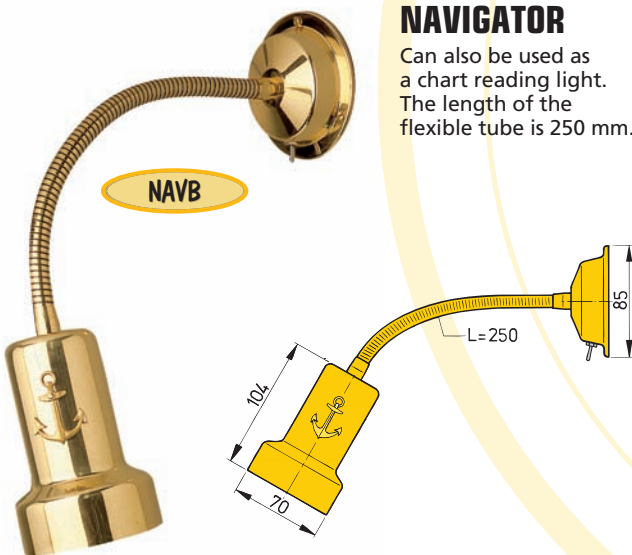
**FINCHMA**



**NAVIGATOR**

Can also be used as a chart reading light. The length of the flexible tube is 250 mm.

**NAVVB**

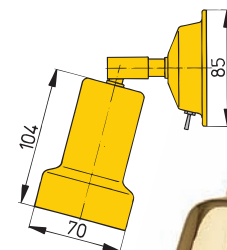


**GOLD TULIP**

(with or without anchor). Rotates through 360°.

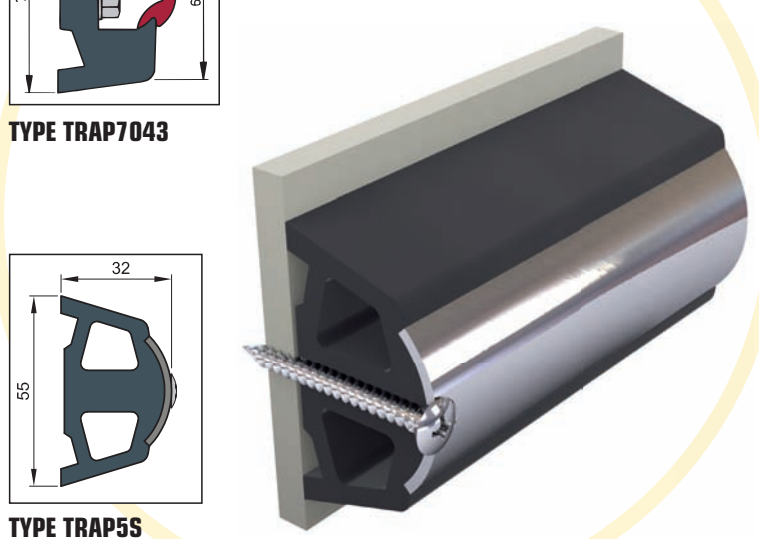
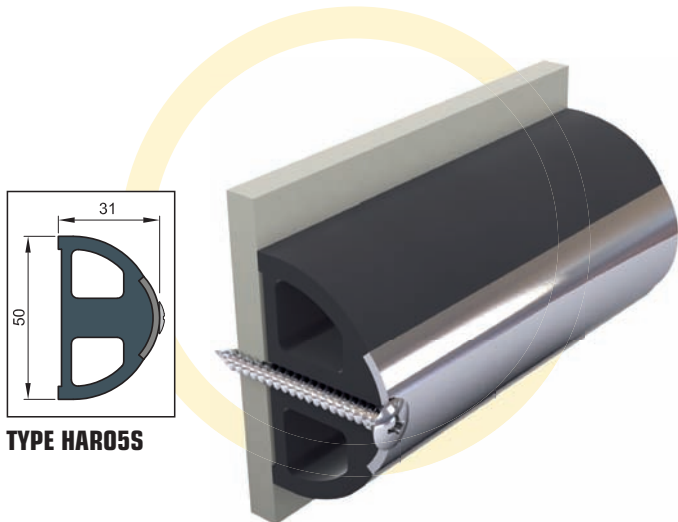
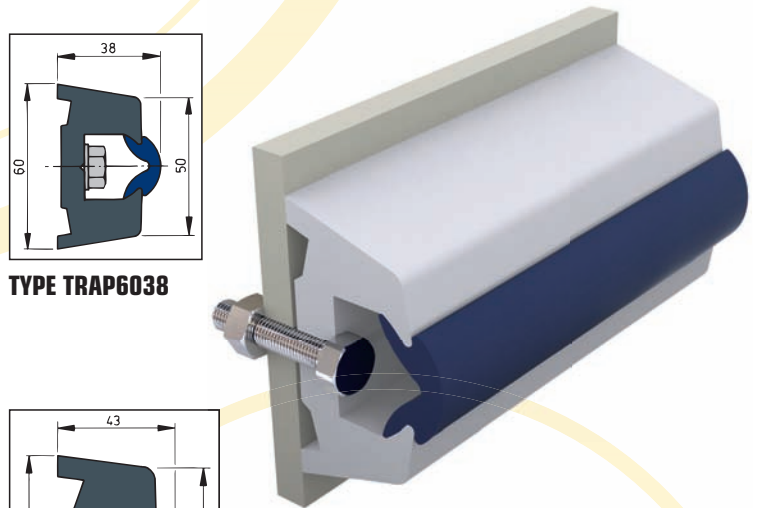
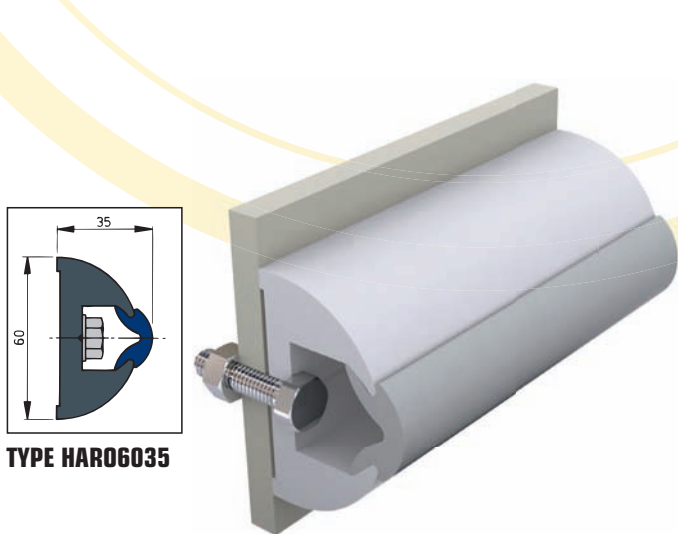
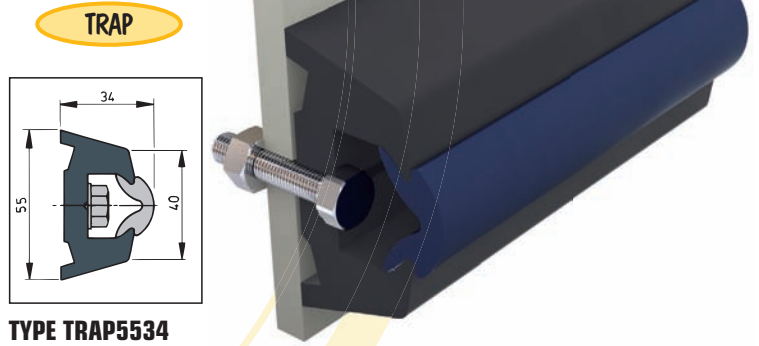
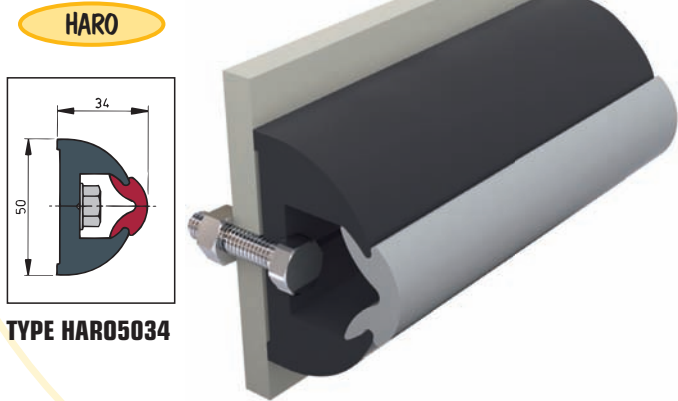
**TULIPM**

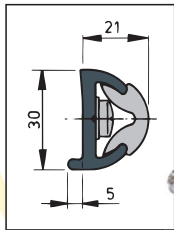
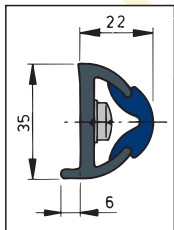
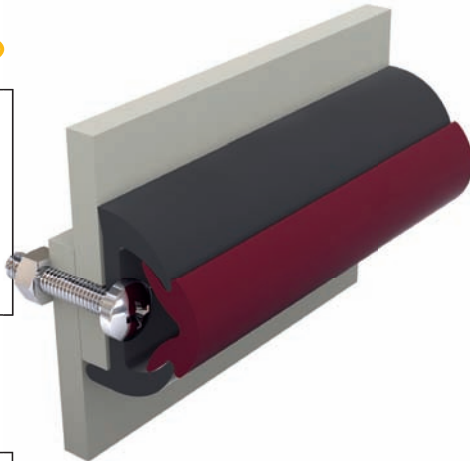
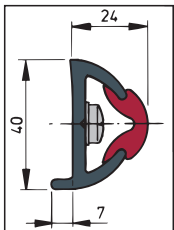
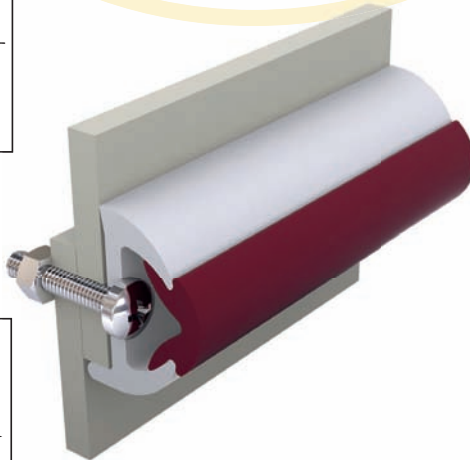
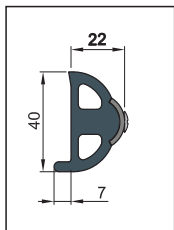
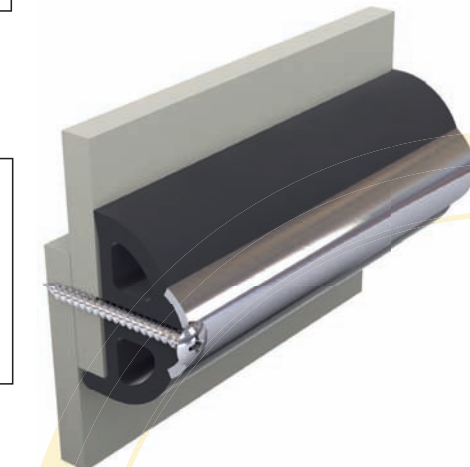
**TULIPMA**



All VETUS rubbing strakes, have a black base profile, for fastening to the boat by means of bolts or screws. Type HARO, TRAP and POLY are also available with a white (RAL 9003) base profile.

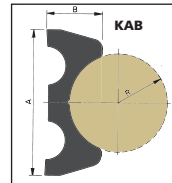
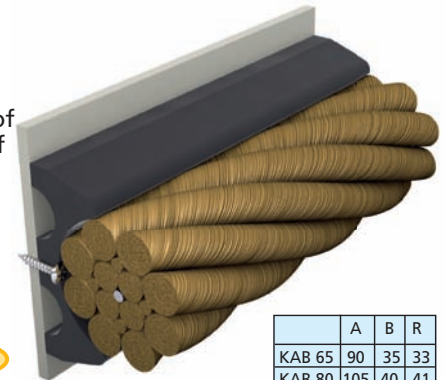
The inlay strips may be supplied in the colours wine-red (RAL3004), cobalt-blue (RAL5013), light grey (RAL7035) black or stainless steel (AISI316). The inlay strips can be replaced easily. All VETUS rubbing strakes are available in lengths of 20 or 30 metres.



**IDEALLY SUITED FOR G.R.P. VESSELS**
**POLY**

**TYPE POLY3026**

**TYPE POLY3528**

**TYPE POLY4031**

**TYPE POLY4S**

**ALL VETUS RUBBING STRAKES CAN BE RENDERED VERY FLEXIBLE BY IMMERSION IN HOT WATER**
**TYPE KAB**

This particular profile is used as a base profile to receive a messenger (rope fender) of Ø 65 or 80 mm. The colour of this base profile is black.


**KAB**


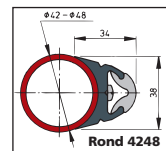
	A	B	R
KAB 65	90	35	33
KAB 80	105	40	41

**VETUS MESSENGERS (ROPE FENDERS)**

Available with diameter of 65 or 80 mm. Colour: Natural. Lengths of 20 or 30 metres. We can also supply the necessary components to tighten the rope fendering properly around the boat.

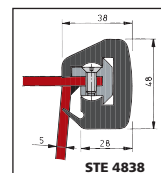
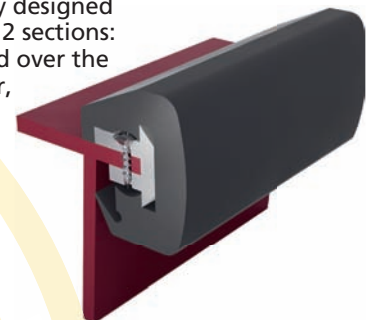

**TYPE ROND 4248**

Many **steel** boats feature a **steel pipe** around the deck, to function as a fender strake. To protect this pipe and its paint, you may use the vinyl rubbing strake, model ROND 4248, **shown here**. The base of this vinyl rubbing strake is **black**.

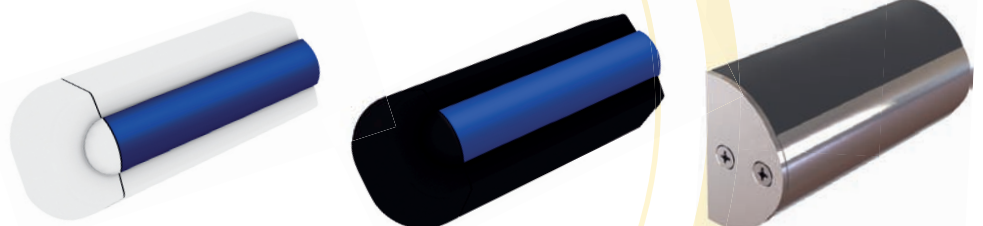

**ROND 4248**

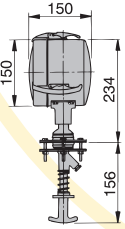
**TYPE STE 4838**

This rubbing strake is also especially designed for steel craft. The profile comes in 2 sections: first, the light-grey section is slipped over the deck edge and fastened. Thereafter, the black section is snapped on.

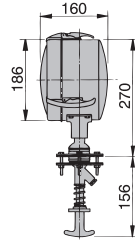

**STE 4838**


For rubbing strake profiles, type HARO, TRAP and POLY, end covers are available in black, white or stainless steel.

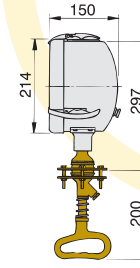




**TYPE Z.50**  
Ø 150 mm 12 or 24 Volt.  
Complete with  
"sealed beam".



**TYPE Z.70**  
Ø 186 mm 12 or 24 Volt D.C.  
Complete with  
"sealed beam".



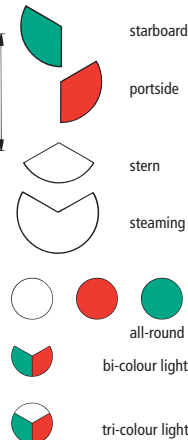
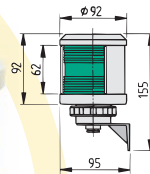
**TYPE ZN.215**  
Ø 214 mm 12 or 24 Volt DC  
or 230 Volt A.C.  
Halogen bulbs are  
supplied separately.

Type	Diam. mm	Code	Voltage	Power in Watt	Range in m	Light output in candle	Beam spread	Finish
Z.50	150	Z5012	12	100	450	200.000	11°- 6°	Stainless steel
		Z5024	24	250	550	300.000	12°-11°	
Z.70	186	Z7012	12	100	475	225.000	9°- 5°	Stainless steel
		Z7024	24	170	480	230.000	9°- 8°	
ZN.215	214	ZN215	12	100	362	131.000	9°- 16°	Powder coated white
		ZN215	24	250	664	441.000	10°-14°	
		ZN215	230	300	345	120.000	15,5°-21°	

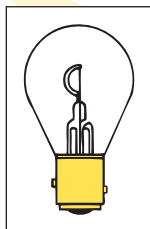
## NAVIGATION LIGHTS

ACCORDING TO I.M.O. SPECIFICATIONS (INTERNATIONAL REGULATIONS FOR PREVENTION OF COLLISIONS AT SEA, COLREG '72).

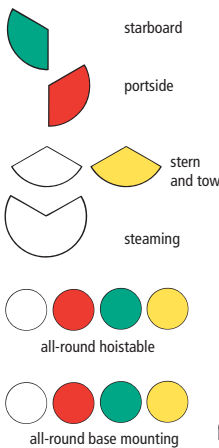
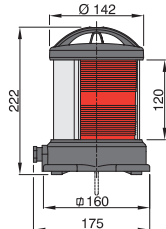
### TYPE 35 FOR BOATS OF LESS THAN 20 METRES IN LENGTH (WITH WHITE OR BLACK COLOURED HOUSING)



### TYPE 55N FOR BOATS OF LESS THAN 50 METRES IN LENGTH



In order to comply with the I.M.O. regulations, each navigation light type 35 or type 55 requires a special approved bulb, which should be ordered separately. Available for 12 and 24 V, 25 W.



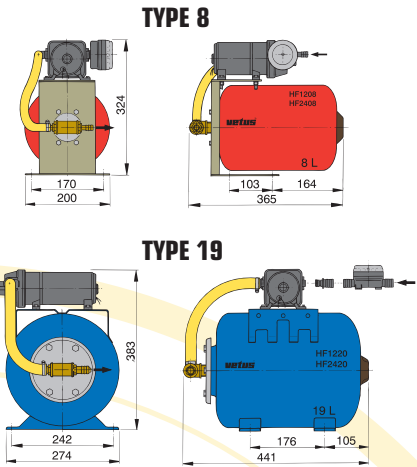
Model 55 N not only meets the abovementioned I.M.O. specifications, but also those of the European standard EN 14744, which will become applicable in future. For the all round lights, a set is available that allows them to be hoisted as well.

Comparable with the piped water system at home, the VETUS pressurized water system provides constant water flow in the vessel's fresh water circuit. The pressurized tank with a rubber diaphragm inside, prevents the pump motor from being started, each time a supply of water is required. This assembly ensures a minimum of noise, a constant water flow and a saving of energy.



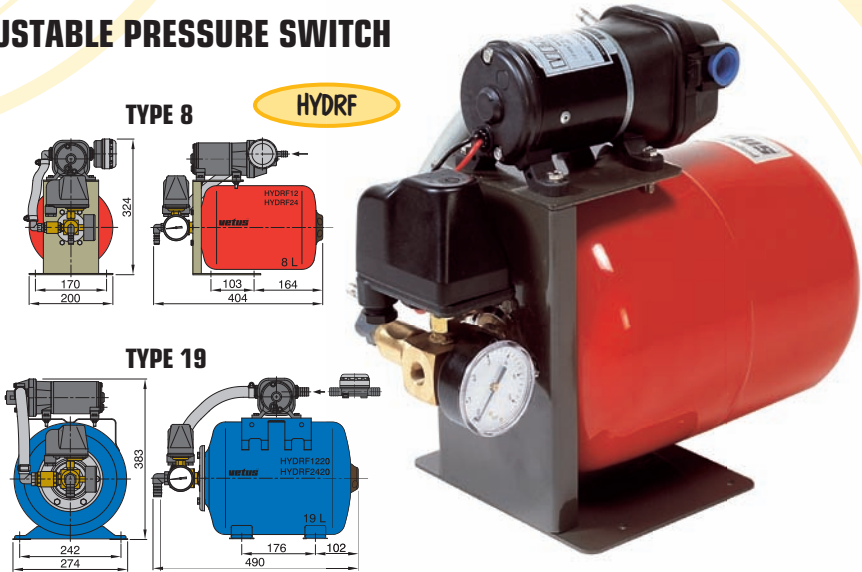
HF

HYDROPHOOR	TYPE 8	TYPE 19
<ul style="list-style-type: none"> <li>contents of pressure tank</li> <li>available in</li> </ul>	8 litre 12 Volt (3,9 A) 24 Volt (2,0 A)	19 litre 12 Volt (6 A) 24 Volt (2,5 A)
<ul style="list-style-type: none"> <li>connection for hose</li> <li>weight</li> <li>capacity</li> <li>max. pressure</li> <li>max. suction height</li> <li>extremely low noise level</li> <li><b>equipped with:</b> <ul style="list-style-type: none"> <li>- self-priming pump</li> <li>- inlet water-strainer</li> <li>- pressure switch</li> <li>- pressurized tank with rubber diaphragm and mounting bracket</li> <li>- the diaphragm is suitable for drinking water and can be replaced</li> </ul> </li> </ul>	Ø 12,7 mm 6,2 kg 12,5 l/min. 2,5 bar (35 psi) 3 m	Ø 19 mm 7,5 kg 17 l/min. 2,8 bar (39 psi) 3 m



## PRESSURIZED WATER SYSTEMS WITH ADJUSTABLE PRESSURE SWITCH

HYDROPHOOR	TYPE 8	TYPE 19
<ul style="list-style-type: none"> <li>contents of pressure tank</li> <li>available in</li> <li>connection for hose</li> <li>weight</li> <li>capacity</li> <li>max. pressure</li> <li>max. suction height</li> <li>extremely low noise level</li> <li><b>equipped with:</b> <ul style="list-style-type: none"> <li>- self-priming pump</li> <li>- inlet water-strainer</li> <li>- adjustable pressure switch</li> <li>- manometer (pressure gauge)</li> <li>- pressurized tank with rubber diaphragm and mounting bracket</li> <li>- additional non-return valve</li> <li>- the diaphragm is suitable for drinking water and can be replaced</li> </ul> </li> </ul>	8 litre 12 Volt (3,9 A) 24 Volt (2,0 A) Ø 12,7 mm 8,2 kg 12,5 l/min. 2,5 kg/cm <sup>2</sup> 3 m	19 litre 12 Volt (6 A) 24 Volt (2,5 A) Ø 19 mm 9,5 kg 17 l/min. 2,8 kg/cm <sup>2</sup> 3 m



## ELECTRIC BILGE PUMPS

Submersible bilge pumps for boats often need to pump the bilge water to a head of more than 1 m. When comparing capacities of submersible bilge pumps, please look at the outputs at "zero head" and at a head of 1 m. All these VETUS pumps are made in conformity with the specification requirements of ABYC H-22, of ISO 8849 Marine and of the U.S. Coast Guard Safety Standards 33 CFR, Part 183.



EBP

EBPFLOAT 1

Automatic float switch

Technical data:								
Model	Capacity in l/min at zero head and with a battery-voltage of 13.6 V	Capacity in l/min. at 1 m head and with a battery-voltage of 13.6 V	Voltage	Amperage	Inside hose diameter in mm	Total height in mm	Diameter of pump housing in mm	Weight in kg.
EBP30	32	22	12	1,2	19	85	74	0,21
EBP 40	41	27	12	1,0	19	104	99	0,37
EBP60	57	44	12	3,0	28	104	99	0,38
EBP80	79	60	12	2,6	28	125	125	0,52

## BILGE WATER/OIL SEPARATOR



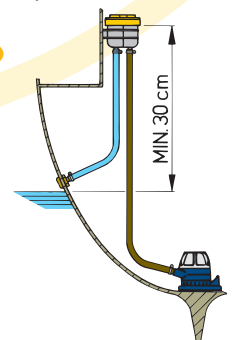
This VETUS separator collects and retains oil and grease from the bilge water. The filter element is replaceable and has a capacity of 320 grams, which is the average quantity of oil in 8.000 litres of bilge water. It will remove 95% of oil in the bilge water, with a maximum contamination level of 300 mg/l (p.p.m.) The bilge pump to be used in combination may have a maximum capacity of 20 litres/ minute. The connections are for Ø 19 mm hoses (see page 90).

Dimensions: L x w x h:  
148 x 150 x 162 mm.

BISEP19

### KEEP THE ENVIRONMENT CLEAN

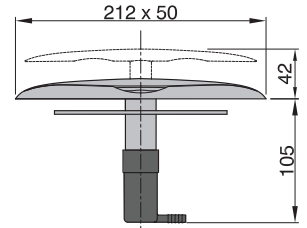
The 12 Volt submersible bilge pump type EBP 30 (depicted here) has a capacity of 20 litres/min at a head of 1 m and is therefore extremely suitable to be used with this VETUS bilge water/oil separator.



## STAINLESS STEEL RETRACTABLE CLEATS (AISI 316)

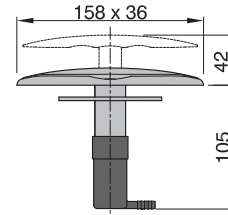


These modern and sophisticated cleats can be retracted almost completely into the deck. The material is stainless steel type AISI 316 and all visible parts are high-gloss polished.

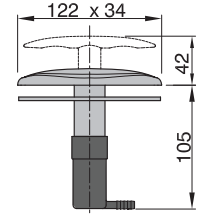


CLF200

The clever design ensures that the cleat will not rattle either in the raised or the retracted position. A simple locking device secures the cleat when retracted. Three versions are available: 115 mm, 152 mm or 215 mm long. Only 3 round holes need to be drilled in the deck and the fitting is pre-drilled to accept  $\varnothing$  8 mm countersunk machine screws. A backing plate is supplied as standard. A water drain, to which a  $\varnothing$  6 mm hose pillar can be connected is also standard. A plastic skin fitting, piece of hose and hose clamps are available as an optional kit.



CLF150



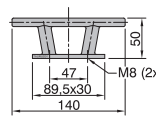
CLF110

## STAINLESS STEEL CLEATS (AISI 316)

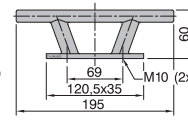


### Maximum safe working load

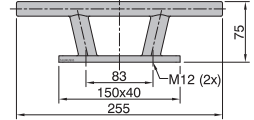
- Taurus01 : 575 kgf
- Taurus02 : 900 kgf
- Taurus03 : 1310 kgf
- Taurus04 : 2470 kgf
- Taurus05 : 2470 kgf
- Taurus06 : 2620 kgf



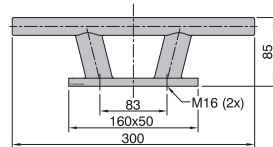
TAURUS01



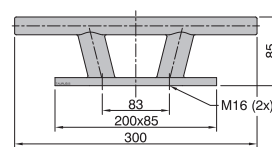
TAURUS02



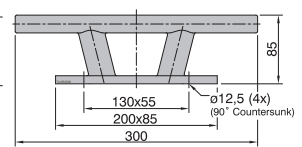
TAURUS03



TAURUS04



TAURUS05



TAURUS06

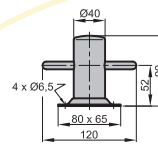
These cleats are made of high-gloss polished stainless steel (AISI 316). With the exception of model TAURUS 06, all cleat base plates are tapped on the underside so that the fastenings will be concealed under-deck. Model TAURUS06 has 4 countersunk holes in the base plate to take M12 fastenings.

## STAINLESS STEEL BOLLARDS (AISI 316)

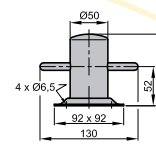


### Maximum safe working load

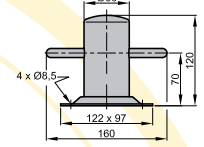
- Achilles080 : 620 kgf
- Achilles090 : 620 kgf
- Achilles110 : 1150 kgf
- Achilles130 : 1150 kgf
- Achilles150 : 1800 kgf
- Achilles160 : 2629 kgf



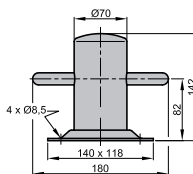
ACHIL080



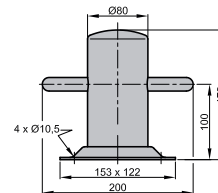
ACHIL090



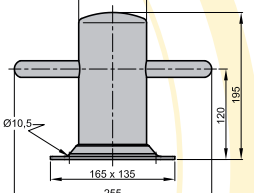
ACHIL110



ACHIL130



ACHIL150



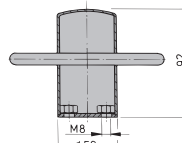
ACHIL160



### BOLLARDS FOR DIRECT WELDING

The above mentioned bollards are also available for direct welding. The sizes are similar.

ACHILZ



A stainless steel bollard for small craft, which is fastened by means of 2 M8-bolts.



ACHIL090B

## ELECTRIC MARINE HORNS

- for 12 or 24 Volt electric installations
- with high pitch or low pitch sound
- single horn, low pitch: 320 Hz, 112 dB (A)
- single horn, high pitch: 370 Hz, 112 dB (A)
- dual horn combination of low and high pitch sound, 115 dB (A) and supplied with relay
- made of chromium plated brass
- connection parts stainless steel
- overall length, "low pitch": 470 mm "high pitch": 400 mm



**M**



**TN**

- for 12 or 24 Volt electric installations
- with high pitch or low pitch sound
- single horn, low pitch: 410 Hz, 109 dB (A)
- single horn, high pitch: 490 Hz, 109 dB (A)
- dual horn combination of low and high pitch sound, 112 dB (A) and supplied with relay
- made of chromium plated ABS and stainless steel
- connection parts stainless steel
- Width: 105 mm
- Height: 110 mm

### STAINLESS STEEL STANCHIONS (AISI 316)

Tapered with 2 wire holes at 300 mm spacing, except for 450 mm model which has only 1 hole. Diameter: 25 mm Length: 450, 500, 550, 610 and 750 mm.



**STANCH**

### STAINLESS STEEL HATCH ADJUSTERS (AISI 316)



**UITSTEL**

Type	Min.length	Max. length
PH	202 mm	368 mm
FE	261 mm	485 mm

### SUMP-PUMP

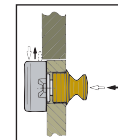
A seawater resistant manual sump-pump, for emptying the engine sump, the gearbox, etc. Complete with tubing.



**CARTERP**

### PUSH-BUTTON LOCK

Made of plastic with chromium or brass coated push-button. Dimensions: 78 x 45 x 20 mm.



**LOCK**



### STAINLESS STEEL STANCHION SOCKETS (AISI 316)

Ø 25 mm, 90° straight or with 6° angle. Dimensions: (l x w x h) 90 x 67 x 60 mm.



### STAINLESS STEEL GRABRAILS (AISI 316)

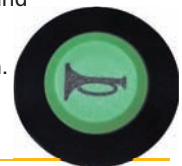
Railing tube available in diameters of 20 mm or 25 mm. Max. length 6 m. End and centre supports (Ø 20 or 25 mm) are supplied separately.



### PUSH-BUTTON FOR MARINE HORN

This push button may operate marine horns, with a current consumption of 15 A maximum. Suitable for 12 and 24 Volt D.C. electrical installations. Cut-out diameter: Ø 31 mm. Outside dimensions: Ø 38 mm. **Watertight to IP67**

**HORNPB**



### WATERTIGHT PLUG AND SOCKET

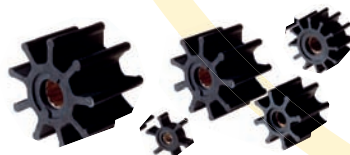


**SC**

Watertight plugs and sockets are available in 2 versions: For cable with a cross sectional area up of to 75 mm<sup>2</sup> or a larger model for cables of up to 125 mm<sup>2</sup>. A rubber gasket and a synthetic cover are standard supply. Material: chromium plated brass.

### NEOPRENE RUBBER IMPELLERS

VETUS CODE	JOHNSON CODE	JABSCO CODE	VETUS PUMP
IMP00101	08-1026B	14673 - 0001	type 52/46
IMP00201	08-1027B	1210 - 0001	type 107
IMP00301	08-1028B	17937 - 0001	type 20
IMP00401	08-1052S-9		
IMP00501	08-806B	4528 - 0001	
IMP00601	08-808B	22405 - 0001	
IMP00701	08-810B	18653 - 0001	type 31
IMP00801	08-814B	21676 - 0001	type 376
IMP00901	08-819B	836 - 0001	type 279



### FIRE PORT (EXTINGUISHER OPENING)

The VETUS FIRE PORT permits a fire extinguisher to be discharged into the engine space, or any other enclosed area. In the event of a fire, the extinguisher nozzle can be inserted through the port in complete safety, thus avoiding fuelling the fire by opening the compartment and minimising risk to the crew.

- Easy to install
- Recommended by CE and ABYC directives
- Also suitable for outboard motors
- Made of UV and seawater resistant synthetic material
- Available with a black or white flange
- Cut-out diameter: Ø 38 mm. Outside dimensions: Ø 76 mm.







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