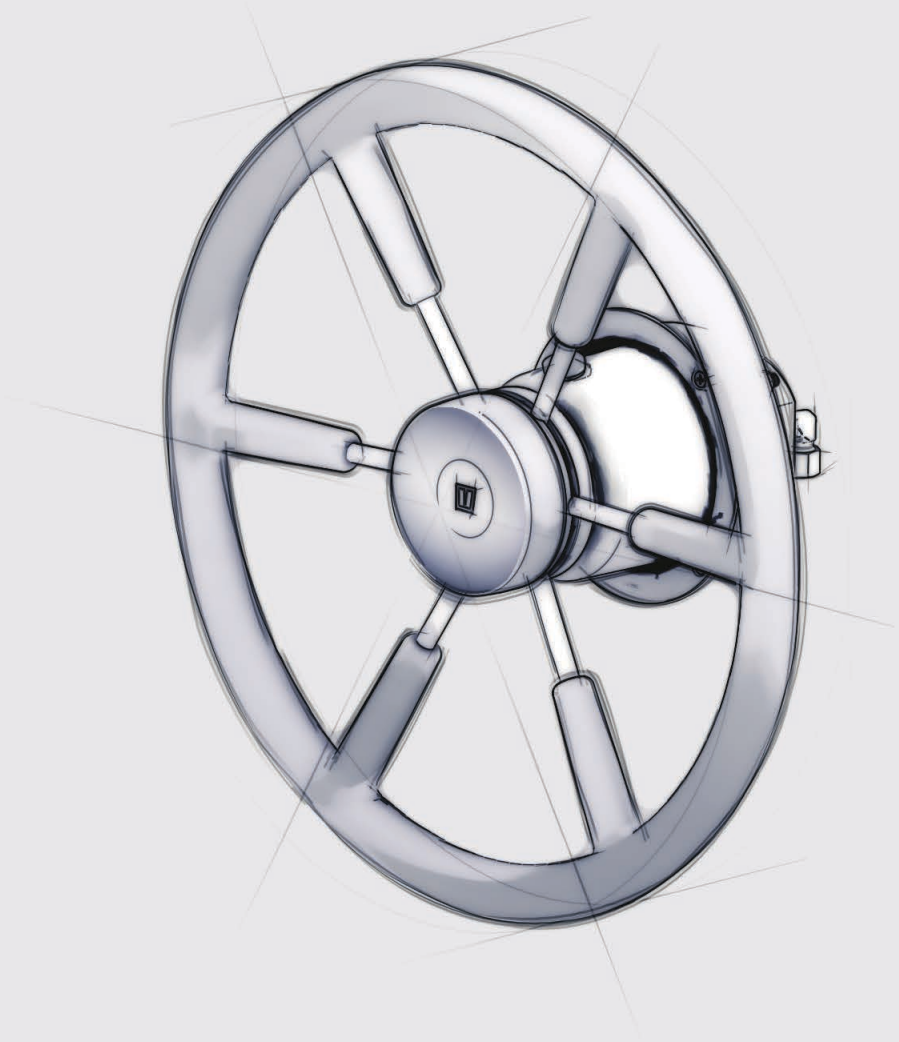
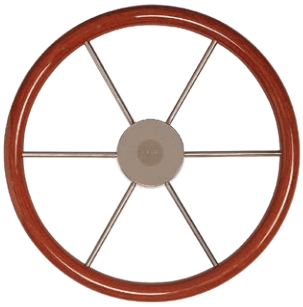
Steering systems



Overview

Steering wheels see page 284 - 288



KW

KWL

PRO40P

PRO40T

KS38

KS36

SWALB

SWCRUISER

Steering pumps see page 291

HTP..B

HTP

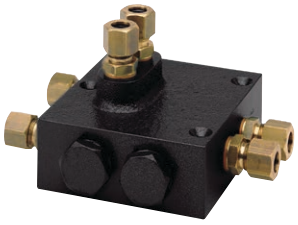
Steering cylinders see page 292 - 297

MTC5210

MT0230B

OBC115A - OBC250A

Accessories see page 299 - 300



K30/140B

BYPASS

HHOSE

HS10131

HS145S

COPPER

Rudders see page 300 - 301

RUDS

HELM

HENKO

Steering wheels

Mahogany steering wheels - Type KW / KWL

This mahogany steering wheel range now has five models from 380 to 810 mm diameter.

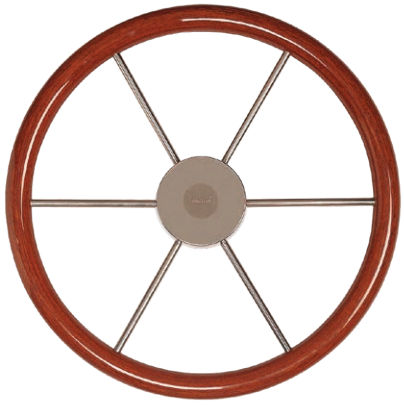
The spokes and hubcap are made from stainless steel (AISI 316). The hub itself is made from seawater resistant aluminium. The beautiful rim is constructed from high gloss lacquered mahogany. Type KWL also features lacquered mahogany spoke sleeves.

Characteristics
- KW series are available in the following diameters: 380, 450, 550, 710 and 810 mm
- High-quality mahogany rim paired to stainless steel (AISI 316) spokes and hubcap
- Aluminium hub bored 19 mm (3/4") with 1:12 taper as standard

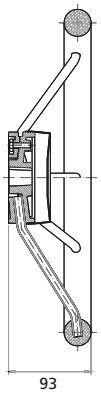
An alternative hub to suit older VETUS steering pumps with a Ø 1" hole shaft and 3½:12 taper is also available.
Product code: SETKS1*.

***Note:** Not suitable for steering wheel KW71 and KW81.

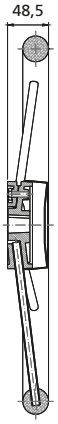
Type	Description	Ø (mm)	Ø shaft (mm)	Taper
KW38	Steering wheel with mahogany rim	380	19	1:12
KW45	Steering wheel with mahogany rim	450	19	1:12
KW55	Steering wheel with mahogany rim	550	19	1:12
KW71	Steering wheel with mahogany rim	710	19	1:12
KW81	Steering wheel with mahogany rim	810	19	1:12



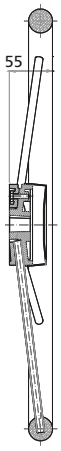
KW38



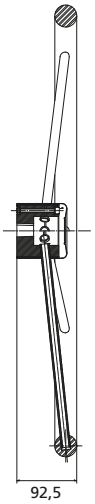
KW45



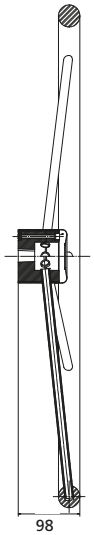
KW55



KW71



KW81

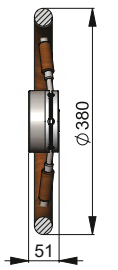


Steering wheels

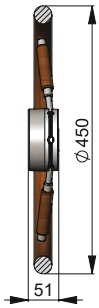
Type KWL

With a mahogany rim

Type	Description	Ø (mm)	Ø shaft (mm)	Taper
KWL38	Steering wheel with mahogany rim and spokes	380	19	1:12
KWL45	Steering wheel with mahogany rim and spokes	450	19	1:12
KWL55	Steering wheel with mahogany rim and spokes	550	19	1:12



KWL38



KWL45

KWL55

Steering wheels

Type PRO

The perfect match for traditional and modern boats

Type PRO has two models. Type 'T' with a satin-gloss varnished teak rim and type 'P' with a semi-hard polyurethane rim which will keep your hands warm. Both models have substantial spokes and a hub cover made of high-gloss polished stainless steel (AISI 316). The hub itself is made of synthetic material and bored for a Ø ¾" shaft with 1:12 taper which will fit most steering systems. These steering wheels are according to the CE and ABYC directives.

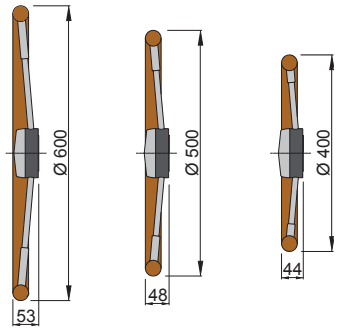
Specifications
- Available with overall diameters of 400, 500 or 600 mm
- Outer rim Ø 32 mm

Note: An alternative hub to suit older steering pumps with a Ø 1" hole shaft and 3½:12 taper is also available (product code: SETPS1).

PRO..P

PRO..T

Type	Description	Ø (mm)	Ø Outer rim (mm)
PRO40P	Polyurethane rim steering wheel	400	32
PRO50P	Polyurethane rim steering wheel	500	32
PRO60P	Polyurethane rim steering wheel	600	32
PRO40T	Teak steering wheel	400	32
PRO50T	Teak steering wheel	500	32
PRO60T	Teak steering wheel	600	32



PASBUSA

All VETUS wheels and steering pumps have a Ø ¾" bore, with a 1:12 taper. The PASBUS is a tapered bushing that can be applied to the ¾" shaft of a steering pump so that it can receive a wheel with a 1" bore. This allows wheels made by others to be installed on our pumps.

PASBUSA

Steering wheels

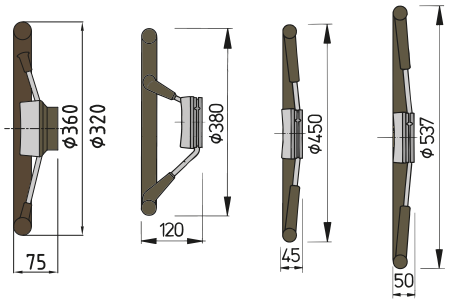
Type KS

No more cold hands

Model KS has stainless steel (AISI 316) rims, spokes and cap. The rims have a layer of semi-hard PU-foam with a smooth surface. These soft-feel wheels are resistant to all weather conditions.

Specifications
- Available with overall diameters of 320, 360, 380, 450 and 550 mm
- All type KS wheels are supplied in the colours grey (RAL 7040) or black
- Bored for Ø ¾" shaft, tapered 1:12

Type	PU-foam layer	Ø (mm)	Ø shaft (mm)	Taper
KS32G	Grey	320	19	1:12
KS32Z	Black	320	19	1:12
KS36G	Grey	360	19	1:12
KS36Z	Black	360	19	1:12
KS38G	Grey	380	19	1:12
KS38Z	Black	380	19	1:12
KS45G	Grey	450	19	1:12
KS45Z	Black	450	19	1:12
KS55G	Grey	550	19	1:12
KS55Z	Black	550	19	1:12

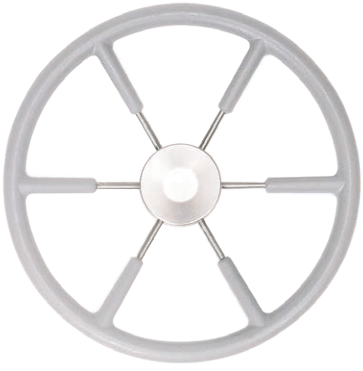


Note: An alternative hub to suit older steering pumps with a Ø 1" hole shaft and 3½:12 taper is also available (product code: SETKS1).

KS32G **KS32Z**

KS36G **KS36Z**

KS38G **KS38Z**



KS45G **KS45Z**

KS55G **KS55Z**

Steering wheels

SW Series

Made from high-quality polyurethane rubber, leather, wood and polished aluminium, these six steering wheels each emit their own vibe. From the classic wooden Tectona, to the futuristic Argentus and the minimalistic Ravus: all styles are represented. Dimensions are kept small to maximize feel and enforce the sporty image, ranging from 310 mm to 350 mm. All steering wheels feature a classy chromed ABS centre cap with the distinctive 'V' logo. Upgrade your interior with one of these stylish steering wheels.

The purpose-built and sporty appearance of the steering wheels complements your boat and with the materials used, they are built to last.

Specifications
- SW series is available in the following diameters: 310, 320, 330 and 350 mm
- Six models in different colors to suit all vessels
- High-quality polyurethane rim paired to polished aluminium spokes and hubcap
- High-quality wooden rim paired to polished aluminium spokes and hubcap
- Bored for Ø ¾" shaft, tapered 1:12.

Type	Description	Diameter (mm)	Colour / Material
SWALB30	Steering wheel "Albus"	310	White leather
SWTEC35	Steering wheel "Tectona"	350	Wood
SWALT33	Steering wheel "Alter"	330	Black polyurethane rubber
SWRAV33	Steering wheel "Ravus"	330	Gray polyurethane rubber
SWARG32	Steering wheel "Argentus"	320	Black p.u. rubber w/ chrome inserts
SWNOC35	Steering wheel "Noctis"	350	Black p.u. rubber w/ chrome inserts

SWALB30

SWTEC35

SWALT33

SWRAV33

SWARG32

SWNOC35

Type SWCRUISER

Cruiser steering wheel

A three-spoke steering wheel finished in silver aluminium accents and a diameter of 350 mm. Bored for Ø ¾" shaft, tapered 1:12.

Type		Ø (mm)
SWCRUISER	Three spoke sport steering wheel, black with aluminium inserts	350

SWCRUISER

How to determine the correct VETUS steering

Various combinations of boat speed, rudder blade surface area and balance sections apply a variety of forces on steering systems. Furthermore the dynamic influences of wind and currents cause steering systems to be continuously used under sometimes harsh conditions.

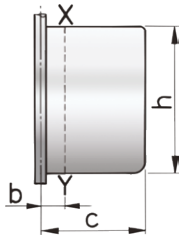
A skipper is dependent on the steering system and therefore it must be reliable under all circumstances. The design of the steering system determines how rapidly the vessel responds to helm movements. Fast light boats react quickly to small rudder movements, while a slow, heavy displacement boats will usually be set up to require more wheel movement for a given change of course. A thoughtful calculation of a steering system is therefore essential.

This section explains how the appropriate steering system can be determined for any boat. Make your choice from a wide range of steering wheels and steering systems.

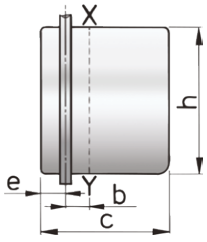
Rudder torque

The choice of the correct cylinder is determined by the rudder torque in Nm (or kg). The rudder torque is the determining factor (Torque = force x lever). To ascertain the correct rudder torque, only the maximum speed of the boat, 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 exceptions, the rudder performs best with a maximum rudder angle of 35° to either side. Contrary to what is sometimes claimed for rudders with normal dimensions, a larger rudder angle does not enhance the manoeuvring capabilities of a boat.

We will be pleased to provide you with recommendations for all steering system components, based on the maximum speed of the boat and a dimensioned sketch or the rudder (provided by you).



Rudder without balance section



Rudder with balance section

The formula to determine the rudder torque:

M (torque) = F x 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 center line of the rudder stock and the centre of pressure which lies on the line X-Y.

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^2.
v = speed in km/hour.
A rudder **without** balance section requires the formula:
b = 0.37 x c (in metres);
A rudder **with** balance section calls for the formula:
b = (0.37 x 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).
$F = 23.3 \times 0.57 \times 1.00 \times 16^2 = 3400$ N (340 kgf)
b = (0.37 x 0.57) - 0.09 = 0.12 m.

Therefore, the rudder torque amounts to 3400 x 0.12 = 408 Nm (41 kgm). So, the hydraulic steering to be selected in this case is model MTC52. With a twin rudder installation, the required torque is 2 x 408 Nm = 816 Nm, which makes model MTC125 the one to choose. We recommend that you consult us for an accurate calculation. We also calculate the effects of the propeller wash, as well as the torque when going astern. Because smaller boats 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.
Be careful: some manufacturers of hydraulic steering have already taken such reduction into account when stating their capacity (torque). We 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.

All VETUS steering systems meet the CE ISO 8848 standard.

Steering systems

Steering system configurations

Below you will find examples of steering systems with one or two steering positions and one or two rudders, with or without non return valves.

Single steering position base system components

One steering pump with or without built-in non-return valves

- One cylinder
- One steering pump
- Hydraulic tubing (with end fittings) and fluid
- Optional: Separate dual non-return valve or by-pass valve (see below)

Dual steering positions base system components

- 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
- Two T- pieces
- Hydraulic tubing (with end fittings) and fluid
- Optional: By-pass valves (see below)

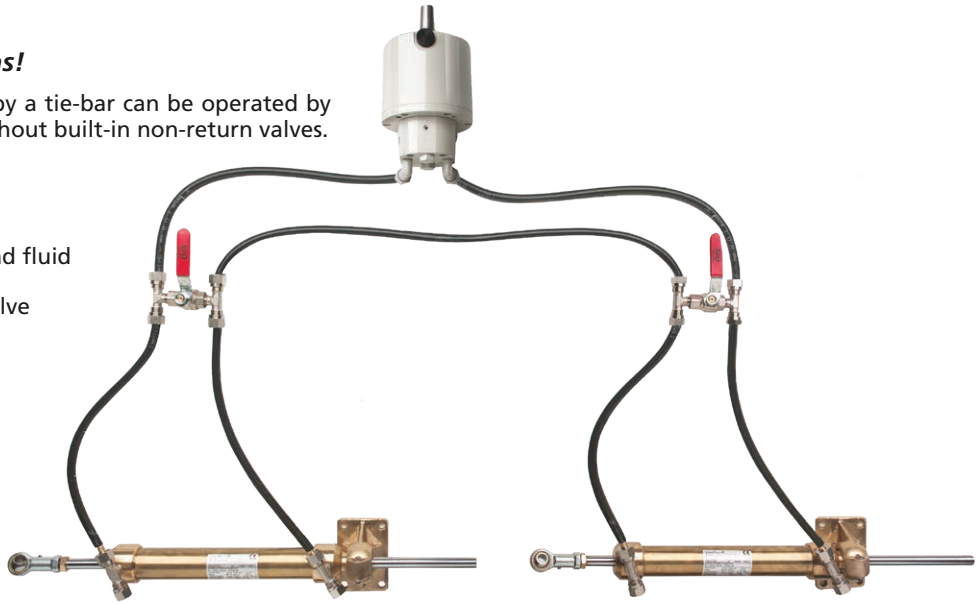
Dual rudder steering

Specifically suitable for catamarans!

Dual rudders which are not connected by a tie-bar can be operated by two cylinders and one pump with or without built-in non-return valves.

Specifications

- Two cylinders
- One steering pump
- Hydraulic tubing (with end fittings) and fluid
- Two by-pass valves
- Optional: Separate dual non-return valve



Steering pumps

HTP and HTPR

These hydraulic steering pumps are suitable for almost all steering wheels (see pages 284 - 288) and have a Ø ¾" shaft, tapered 1:12. Available in black or white.

Both types are supplied with
- Compression fittings (for the pressure lines) and a balance pipeline port
- Mounting studs, nuts and washers
- One vented and one un-vented filler plug

Type HTPR has in addition
- An integrated non-return valve with continuous air bleeding system
- An integrated pressure relief valve for protection against over pressurisation of the system

HTP..B

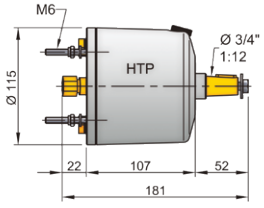
HTP

VETUS offers two different types of steering pumps

Types HTP 20/30/42

A steering pump without non-return valves.

HTP20 HTP30 HTP42



HTP

Steering pumps without non return valves

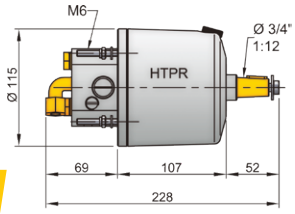
Type	Color	Tubing Ø (mm)	Capacity (cm³/rev.)	Number of pistons	Weight without valve (kg)	Min/Max. steering wheel diameter*
HTP2010	White	10	19,7	5	3,3	35/71 cm
HTP3010	White	10	30,0	5	3,3	35/71 cm
HTP4210	White	10	42,0	7	3,3	45/71 cm
HTP2010B	Black	10	19,7	5	3,3	35/71 cm
HTP3010B	Black	10	30,0	5	3,3	35/71 cm
HTP4210B	Black	10	42,0	7	3,3	45/71 cm

* Smaller steering wheels may always be mounted, although this will increase steering effort.

Type HTPR 20/30/42

A steering pump with integrated non-return valve and pressure relief valves.

HTP20R HTP30R HTP42R



HTPR

Steering pumps with non return valves

Type	Color	Tubing Ø (mm)	Capacity (cm³/rev.)	Number of pistons	Weight without valve (kg)	Min/Max. steering wheel diameter*
HTP2010R	White	10	19,7	5	4,1	35/71 cm
HTP3010R	White	10	30,0	5	4,1	35/71 cm
HTP4210R	White	10	42,0	7	4,1	45/71 cm
HTP2010RB	Black	10	19,7	5	4,1	35/71 cm
HTP3010RB	Black	10	30,0	5	4,1	35/71 cm
HTP4210RB	Black	10	42,0	7	4,1	45/71 cm

* Smaller steering wheels may always be mounted, although this will increase steering effort.

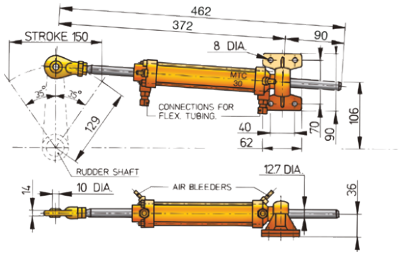
Cylinders

The cylinders below are supplied as standard with zinc plated steel rod ends. Stainless steel (AISI 316) rod ends are available as an option.

Type MTC3008

MTC3008

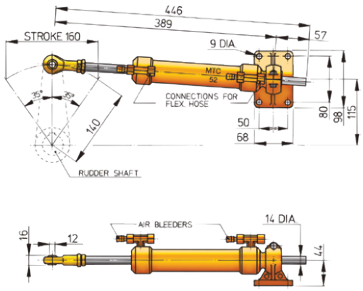
Type	Tubing Ø (mm)
MTC3008	8



Type MTC5210

MTC5210

Type	Tubing Ø (mm)
MTC5210	10

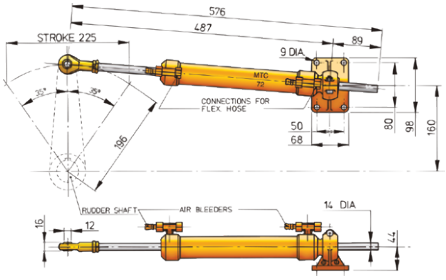


Type MTC7210

MTC7210

MTC7210SL

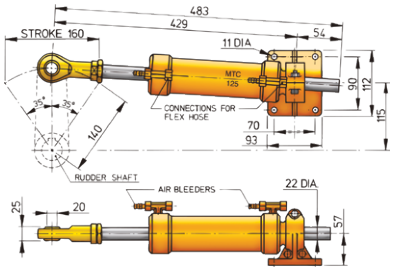
Type	Tubing Ø (mm)
MTC7210	10
MTC7210SL	10



Type MTC12510

MTC12510

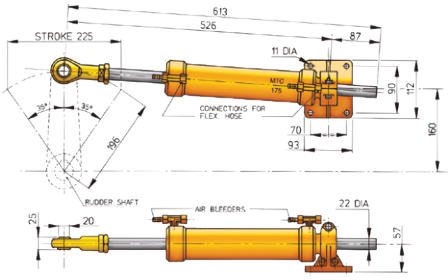
Type	Tubing Ø (mm)
MTC12510	10



Type MTC17510

MTC17510

Type	Tubing Ø (mm)
MTC17510	10



Steering pumps and cylinders

This table shows combination of pumps and cylinders.

Pump type 20

Pump type 30

Pump type 42

Cylinder type MTC3008	**Wheel turns 3.4**		
• Stroke 150 mm • Volume 67 cm³ • Length of tiller arm 129 mm • Weight 1,8 kg • Always use HS1010MS 	• Max. Torque **294**Nm (**30**kgm) (216ft.lbs). • Torque at 35° and 56kg/cm² 241Nm (24,6kgm) (178ft.lbs) • Tubing nylon hose Ø 6 x Ø 8mm	N/A	N/A
Cylinder type MTC5210	**Wheel turns 5.3**	**Wheel turns 3.5**	
• Stroke 160 mm • Volume 104 cm³ • Length of tiller arm 140 mm • Weight 3,4 kg 	• Max. Torque **510**Nm (**52**kgm) (376ft.lbs). • Torque at 35° and 56kg/cm² 412Nm (42kgm) (304ft.lbs) • Tubing nylon hose Ø 6 x Ø 10mm copper Ø 8 x Ø10 mm	• Max. Torque **510**Nm (**52**kgm) (376ft.lbs). • Torque at 35° and 56kg/cm²: 412Nm (42kgm) (304ft.lbs) • Tubing: nylon hose Ø 6 x Ø 10mm or Ø 8 x Ø 12mm copper Ø 8 x Ø 10mm	N/A
Cylinder type MTC7210	**Wheel turns 7.5**	**Wheel turns 4.9**	**Wheel turns 3.5**
• Stroke 225 mm • Volume 146 cm³ • Length of tiller arm 196 mm • Weight 3,8 kg 	• Max. Torque: **706**Nm (**72**kgm) (521ft.lbs). • Torque at 35° and 56kg/cm²: 589Nm (60kgm) (434ft.lbs) • Tubing: nylon hose Ø 6 x Ø 10mm or copper Ø 8 x Ø 10mm	• Max. Torque **706**Nm (**72**kgm) (376ft.lbs). • Torque at 35° and 56kg/cm²: 589Nm (60kgm) (434ft.lbs) • Tubing: nylon hose Ø 6 x Ø 10mm or Ø 8 x Ø 12mm or copper Ø 8 x Ø 10mm	• Max. Torque **706**Nm (**72**kgm) (376ft.lbs). • Torque at 35° and 56kg/cm²: 589Nm (60kgm) (434ft.lbs) • Tubing: nylon hose Ø 6 x Ø 10mm or Ø 8 x Ø 12mm or copper Ø 8 x Ø 10mm
Cylinder type MTC12510		**Wheel turns 8.5**	**Wheel turns 6.1**
• Stroke 160 mm • Volume 253 cm³ • Length of tiller arm 140 mm • Weight 7,1 kg 	N/A	• Max. Torque **1226**Nm (**125**kgm) (904ft.lbs). • Torque at 35° and 56kg/cm2: 981Nm (100kgm) (723ft.lbs) • Tubing: nylon hose Ø 6 x Ø 10mm or Ø 8 x Ø 12mm or copper Ø 8 x Ø 10mm	• Max. Torque **1226**Nm (**125**kgm) (904ft.lbs). • Torque at 35° and 56kg/cm²: 981Nm (100kgm) (723ft.lbs) • Tubing: nylon hose Ø 6 x Ø 10mm or Ø 8 x Ø 12mm or copper Ø 8 x Ø 10mm
Cylinder type MTC17510			**Wheel turns 8.5**
• Stroke 225 mm • Volume 356 cm³ • Length of tiller arm 196 mm • Weight 8 kg 	N/A	N/A	• Max. Torque **1717**Nm (**175**kgm) (1266ft.lbs). • Torque at 35° and 56kg/cm²: 1373Nm (140kgm) (1013ft.lbs) • Tubing: nylon hose Ø 6 x Ø 10mm or Ø 8 x Ø 12mm or copper Ø 8 x Ø 10mm

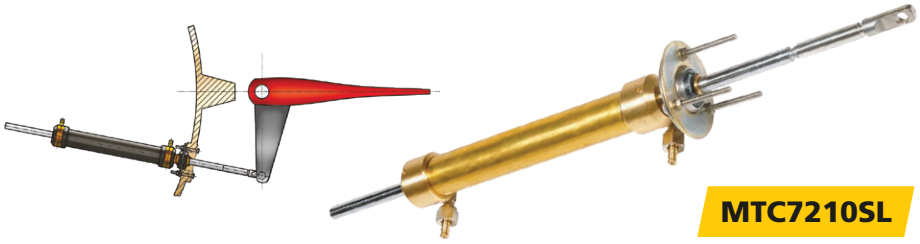
Steering systems

Cylinders

Hydraulic steering cylinder

For transom hung rudders

Specifications
- Stroke 225 mm
- Volume 146 m³
- Length of arm 196 mm



MTC7210SL

Type	
MTC7210SL	Cylinder type MTC72SL for transom hung rudders

Hydraulic steering kit

An attractive solution for smaller boats

This kit includes:
- Pump type HTP2010 (white)
- Cylinder type MTC3008
- Nylon hose 15 m type HS04N
- Hydraulic steering oil 1 L type VHS1
- All required fittings

Specifications
- Max. torque 294Nm (30 kgm, 216 ft.lbs)
- Wheel turns 3,4
- Stroke 150 mm
- Volume 67 m³
- Length of tiller arm 129 mm

MTC30KIT

Type	
MTC30KIT	Hydraulic steering kit including cylinder (MTC30), pump (HTP2010), nylon tubing (15 metres), fittings and oil

Hydraulic steering oil type VHS1

Optimal functioning in all temperatures

For more information see page 471.

VHS

Steering systems for outboard engines

An outboard engine steering system consists of a steering pump with non-return and pressure relief valves and a cylinder. The cylinder is connected to the pump with nylon hydraulic hose. We offer the OBC hydraulic cylinder suitable for outboard motors with an output of 84 kW (115hp) up to 220 kW (300hp).

Cylinder types OBC115A - OBC250A - MTC100Z

Specifications
- OBC115/250A: Balanced cylinder
  MTC100Z: Unbalanced cylinder (132 cc / 163 cc)
- Supplied with combined Ø 10 mm hose connections and bleed nipples
- Piston rod with scraper seals preventing damage from salt and dirt and T-pieces to connect the cylinders

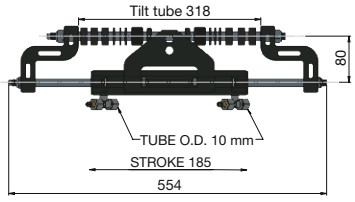
OBC...A

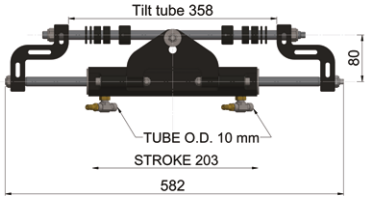
Steering systems for outboard engines

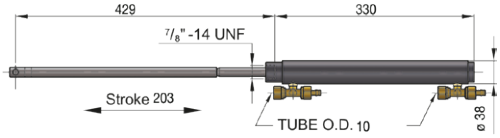
Required components to order separately
- One or two steering pumps with built-in non-return valves, type HTPR
- Length of hydraulic hose Ø 8 x 12 mm, type HHOSE8
- Straight or right angle hose connectors
- Hydraulic fluid
- T-pieces for Ø 10 mm pipe (when more than one pump or cylinder is installed)

MTC100Z

Cylinder	OBC115A	OBC250A	MTC100Z
Max. HP	115	250	300
Cylinder stroke	185 mm	203 mm	203 mm
Cylinder volume	85 cc	122 cc	132 cc / 163 cc
Max. pressure	70 bar	70 bar	70 bar







Specifications
- Maximum operating pressure 70 bar
- Connections G 1/4- Ø 10 mm
- Nylon hose Ø 8 x Ø 12 mm

- Capacity 19,7 cm³/rev.
- Number of pistons 5
- Weight 4,1 kg

HTP2010R.

- Capacity 30 cm³/ rev.
- Number of pistons 5
- Weight 4,1 kg

HTP3010R.

OBC115A
- Stroke 185 mm
- Volume 85 cm³
- Workload 330 kgf
- Max. engine output 115 hp

Wheel turns
port - starboard: 4,3

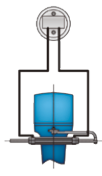
N/A

OBC250A
- Stroke 203 mm
- Volume 122 cm³
- Workload 422 kgf
- Max. engine output 250 hp

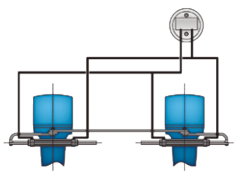
Wheel turns
port - starboard: 6,2

Wheel turns
port - starboard: 4,1

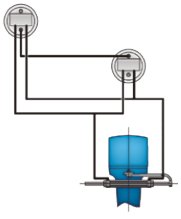
A single cylinder can operate a **twin** outboard motor installation. If both propellers rotate in the same direction, the total engine output may not exceed the maximum capacity of the selected cylinder. If the motors have handed (counter-rotating) propellers, the total combined output may be twice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



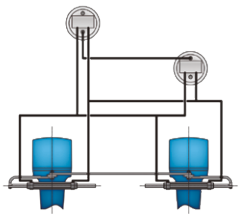
Single steering position for one engine



Single steering position for two engines



Dual steering position for one engine



Dual steering position for two engines

Heavy Duty Steering systems

Type MT0230B / MT0345B / MT0455B / MT0600B / MT0900B / MT1200B

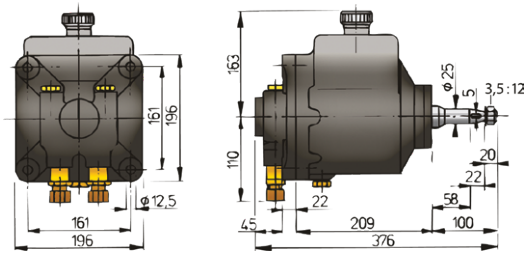
The best possible combination

Choosing the right combination of pump and cylinder can be a challenge. VETUS pumps and cylinders are fully compatible, enabling the builder and owner to choose the best combination of price and number of wheel turns lock to lock. The smaller the pump unit, the lower the price but also the higher the number of turns. However, the choice of cylinder is always determined by the rudder torque. Please see the tables below for determination of the wheel turns.

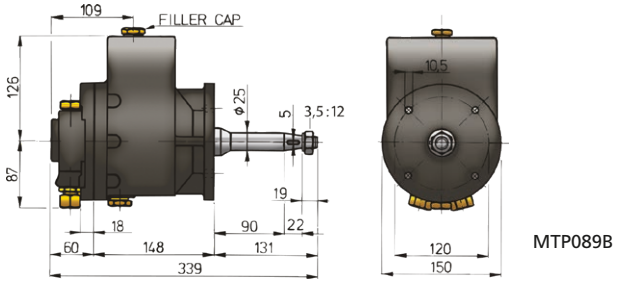
Specifications
- Available for single and dual station control
- Cylinders are supplied with flexible hose tails, bleed nipples (which accept a quick-release coupling for rapid bleeding) and a base plate with universal joint and a swiveling rod end
- Axial plunger pumps with seven plungers
- 1" (25 mm) diameter Stainless steel (AISI 316) steering wheel shaft (extra strong for large steering wheels)
- Cylinder and pump can be supplied separately

MTP151B **MTP191B**

MTP089B



MTP0151B
MTP191B



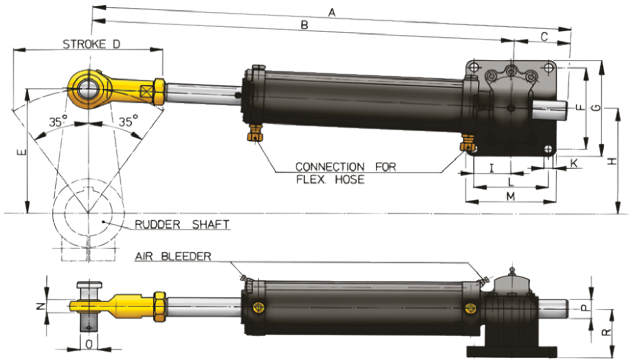
MTP089B

Specifications pump units	MTP089B	MTP151B	MTP191B
Capacity of pump unit	($5^{7}/_{16}$ cu.inch/rev) / 89 cm³/rev.	($9^{7}/_{32}$ cu.inch/rev) / 151 cm³/rev.	($11^{21}/_{32}$ cu.inch/rev) / 191 cm³/rev.
Number of pistons	7	7	7
Maximum pressure	63 kg/cm² (6178 kPa) (896 lb/sq. inch)		
Dimensions of tubes	Ø 18 mm x 15 mm		
Connections	G $^{1}/_{2}$ female pipe thread		
Weight of pump unit	20 lb (9.1 kg)	50.7 lb (23 kg)	50.7 lb (23 kg)
Min/Max steering wheel diameter*	25.5/39.7" (70/101 cm)	39.3/47.6"(100/121 cm)	39.3/47.6" (100/121 cm)

* Smaller steering wheels may always be mounted, although this will increase steering effort.

Cylinders

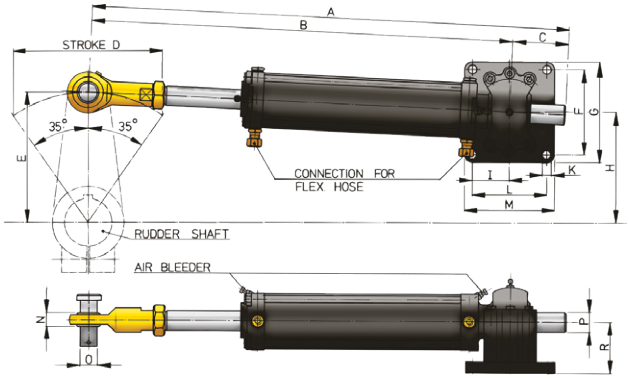
MT0230B **MT0345B** **MT0455B**



Heavy Duty Steering systems

MT1200B

MT0230B



MT0230B -MT1200B

Cylinder	A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	R
MT0230B	733	607	127	200	175	112	140	143	36	11	72	100	31	25	28	55
MT0345B	933	757	177	300	260	112	140	215	36	11	72	100	31	25	28	55
MT0455B	1133	907	227	400	350	112	140	286	36	11	72	100	31	25	28	55
MT0600B	735	695	40	200	175	160	198	143	71,5	18,5	143	182	25	35	40	102
MT0900B	935	845	90	300	260	160	198	215	71,5	18,5	143	182	25	35	40	102
MT1200B	1135	995	140	400	350	160	198	286	71,5	18,5	143	182	25	35	40	102

Theoretical number of steering wheel turns from starboard to port

Pump unit	Cylinder					
	MT0230B	**MT0345B**	**MT0455B**	**MT0600B**	**MT0900B**	**MT1200B**
MTP089B	5.6	8.4	11.2	14.8	22.2	29.6
MTP151B	3.3	5.0	6,6	8.8	13.1	17.5
MTP191B	2.6	3.9	5.2	6.9	10.4	13.8

Technical data cylinders	MT0230B	MT0345B	MT0455B	MT0600B	MT0900B	MT1200B
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/cm²) (896 lbs/sq.inch)					
Cylinder volume	500 cm³	750 cm³	1000 cm³	1319 cm³	1978 cm³	2638 cm³
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.					

Also available for single and dual steering

Type	Description
HS81B	Dual non-return valve (G1/2) (incl. tube connectors Ø 18 mm)
HS74B	Single non-return valve (G1/2) with by-pass valve (incl. tube connectors Ø 18 mm) (suitable for single and dual station)
HS42B	Pressure relief valve (G1/2) (incl. tube connectors Ø 18 mm)

Accessories for steering systems

OB1000 Tie bar

For connecting two outboard motors up to 300 hp each

The tie bar has adjustable ends and connection bolts (3/8"UNF). The maximum centre-to-centre distance between the steering arms is 915 mm. The bar can be easily cut to the required length. All components of the tie bar are made of stainless steel (AISI 316).

Type	Description
OB1000	Tie bar for outboard engines

OB1000

Pump flanges type HTPF

Embellishment for your pump

These polished stainless steel (AISI 316) flanges can be used to fit pump type HTP (or to replace older type MTP) and to recess your pump by 38 mm (type HTPF) or 74 mm (type HTPF2). It can also be used to give your pump a more refined look.

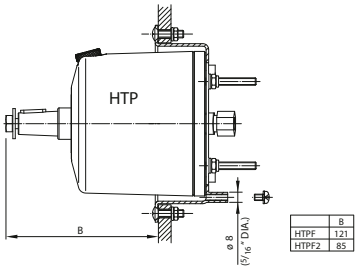
On an outside helm station, with a pump mounted on an inclined bulkhead or sloping dashboard, the housing of the telescopic wheel adjuster may catch water. To prevent this water entering the boat, a seal set is recommended (Type HTPF3).

Type	Description
HTPF	Adapter flange, stainless steel (AISI 316) for HTP pump, 38 mm depth
HTPF2	Adapter flange, stainless steel (AISI 316) for HTP pump, 78 mm depth
HTPF3	Waterproof seal kit for HTP pump in a HTPF flange

HTPF

HTPF2

HTPF3



	B
HTPF	121
HTPF2	85

Hydraulic fluid header tank type HTANK

This transparent tank can be installed with all steering pumps up to 89 cm³ per revolution. It is also recommended for electro-hydraulic hatch lifters when operating more than one cylinder. By installing this tank, the breather plug in the steering pump can be replaced with the supplied solid plug, eliminating the possibility of steering fluid dribbling from the breather in big seas.

Specifications
- Capacity 200 cm³
- Supplied with a large mounting bracket
- Comes with 1 mtr of Ø 8 mm hose, two matching hose clips, one G¼ and one 1 G3/8 nylon hose pillar

Type	Description
HTANK	Expansion tank kit for hydraulic steering systems

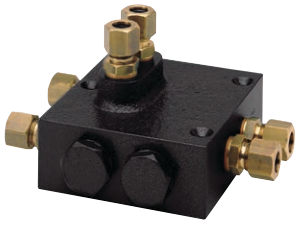
HTANK

Accessories for steering systems

Dual non-return valve

This dual non-return valve block has to be installed when dual station steering is required and the pumps do not have integrated non-return valves. Alternatively, you can use two steering pumps with built-in non-return valves type HTPR. This is also the case when an electro-hydraulic pump needs to be installed when fitting an autopilot and the installed steering pumps do not have integrated non-return valves.

The connection kit must be ordered separately and is not included with the K30/140B.



K30/140B

Type	Description
K30/140B	Dual non-return valve block without fittings used with cylinders MTC3008 to MTC17510
KITK30	Connection kit, 8 mm, to be used with K30/140B and MTC3008
KITK52175	Connection kit, 10 mm, to be used with K30/140B and MTC5210 - MTC17510

KITK30

KITK52175

By-pass valve

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

Type	Tubing Ø (mm)
BYPASS8	8
BYPASS10	10

BYPASS

Nylon hose

Suitable for cylinders MTC52-175.

HHOSE

Type	Internal Ø (mm)	External Ø (mm)	Length in rolls of (m)	Required connection parts
HS04N	6	8	15	HS1011S Sleeve insert (20 pieces)
HHOSE6015	6	10	15	HS145S Sleeve insert (20 pieces)
HHOSE6030	6	10	30	HS145S Sleeve insert (20 pieces)
HHOSE6050	6	10	50	HS145S Sleeve insert (20 pieces)
HHOSE6100	6	10	100	HS145S Sleeve insert (20 pieces)
HHOSE8015	8	12	15	HS1031MS (straight, set of 2 pieces) / HS1037MS (angled, set of 2 pieces)
HHOSE8030	8	12	30	HS1031MS (straight, set of 2 pieces) / HS1037MS (angled, set of 2 pieces)
HHOSE8050	8	12	50	HS1031MS (straight, set of 2 pieces) / HS1037MS (angled, set of 2 pieces)
HHOSE8100	8	12	100	HS1031MS (straight, set of 2 pieces) / HS1037MS (angled, set of 2 pieces)

Copper tubing

Copper tubing is available per roll in two different sizes.

Type	Internal Ø (mm)	External Ø (mm)	Length (m)	Required connection parts
COPPER10	8	10	20	MTC810 Flexible hose tail set
COPPER18	15	18	10	N/A

COPPER

Accessories for steering systems

Connection parts

When using compression fittings supplied as standard with non-commercial pumps and cylinders, a brass sleeve must be inserted into each end of the nylon hose in order to maintain hose circularity. An alternative connection method for 8 x 12 mm nylon hose is to use barbed connections HS1031MS and HS1037MS.

Type	Description
HS213	Union tee coupling 10 mm
HS10131	Sleeve insert Ø 6 mm and olive, Ø 8 mm for use with HS04N nylon hose, pack of 10 pieces
HS1011S	Sleeve insert, Ø 6 mm, for use with HS04N, pack of 20 pieces
HS145S	Sleeve insert, Ø 6,5 mm, for use with nylon hose (HHOSE6...), pack of 20 pieces
HS1031MS	Straight brass hose connector for nylon hose Ø 8 x 12 mm (HHOSE8..), pack of 2 pieces
HS1037MS	Right angle brass hose connector for nylon hose Ø 8 x 12 mm (HHOSE8..), pack of 2 pieces

HS10131

HS213

HS1011S

HS145S

HS1031MS

HS1037MS

Rudders

Type RUDS

These rudders with stainless steel (AISI 316) blade come complete with a rudder arm to which a VETUS hydraulic steering cylinder can be connected. The blade sides are polished and need no additional finishing. The stainless steel (AISI 316) rudder stock is provided with a hole to facilitate the fitting of an emergency tiller. Type RUDS comes in two heights.

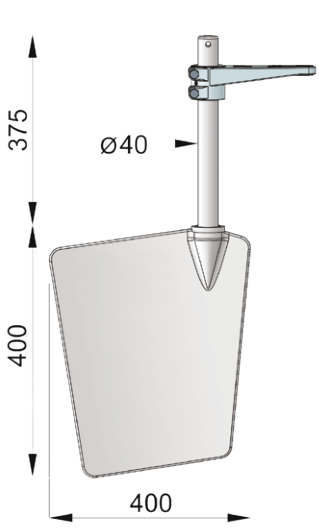
Includes a HELM rudder arm. Connection kit (HSET) must be ordered separately.

Specification type RUDS4040
- Dimensions w 400 x h 400 mm (excluding rudder arm)

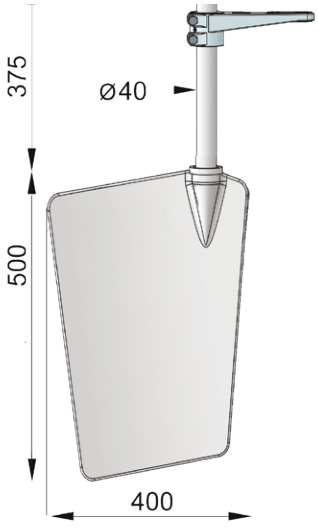
Specification type RUDS5040
- Dimensions w 400 x h 500 mm (excluding rudder arm)

A rudder gland may be supplied as an extra (type HENKO only).

Type	Width (mm)	Height (mm)
RUDS4040	400	400
RUDS5040	400	500



RUDS4040



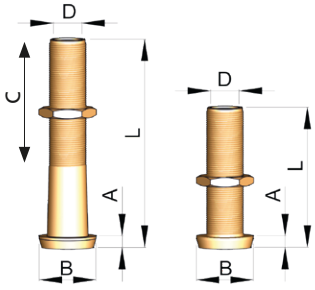
RUDS5040

Rudders

Rudder gland type HENKO

This bronze rudder gland is available in two different lengths for Ø 30 or Ø 40 mm rudder stocks.

Type	Ø D (mm)	L (mm)	A (mm)	Ø B (mm)	C (mm)
HENKO30	30	175	15	65	-
HENKO30L	30	275	15	65	160
HENKO40	40	205	17	80	-
HENKO40L	40	305	17	80	160



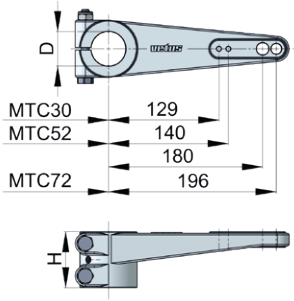
HENKO..L HENKO

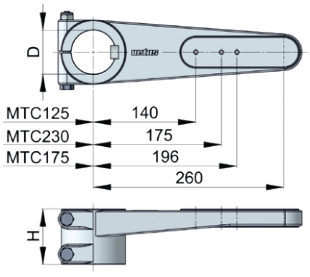
Aluminium rudder arms type HELM

These rudder arms are available for Ø 30, 40, 50 or 60 mm rudder stocks. They are connected by two clamp bolts. The Ø 30 mm and 40 mm rudder arms have two locking grub screws onto the shaft and feature four attachment points for the steering cylinder making them suitable for VETUS hydraulic cylinders type MTC30/52 and 72. The Ø 50 and 60 mm rudder arms have a stainless steel (AISI 316) key and feature three attachment points which match type MTC125/175 and 230. For connecting VETUS cylinder types MTC30/175 matching bolt sets (HSET10/HSET12/HSET20) are available.

Type	Ø D (mm)	H (mm)
HELM30	30	56
HELM40	40	66

Type	Ø D (mm)	H (mm)
HELM50	50	66
HELM60	60	76





HELM

HSET

Type	Description
HSET10	Connection kit M10, for rudder arm to cylinder MTC30
HSET12	Connection kit M12, for rudder arm to cylinders MTC52-72
HSET20	Connection kit M20, for rudder arm to cylinders MTC125-175