

CARIBONI



CARIBONI
CARITEC

HYDRAULIC EQUIPMENT
CUSTOM ARRANGEMENTS

2024





*[...] It is never easy, but when you do achieve the goal
it does feel even better.
It is another great success for Cariboni
And you should all be very proud
Of that you have created here.*

THANKS!

Volvo Ocean Race





Giovanni Cariboni

working on a custom PTO arrangement

Giovanni Cariboni was born in Bellano on the Lake of Como the 16th of November 1948.

He approached to the sail world when he was very young and he started sailing alone on a Dighy 12' at the age of 10.

He took part in the regatta on the Snype as a crew member when he was only 14 years old and he continued to take part in the regatta also with the FD for other 2 years in the Italian seas.

He started sailing on the Star class when he was 16 years old, but after one year, he decided to move on the 5.50 s.i. to be able to gain experience in the international sail environment.

While he was studying at the Mechanical High School Giovanni's design experience began growing up thanks to the collaboration with Eng. Carcano.

During summer vacation, he was collaborating with Eng. Carcano developing the 5.50 s.i. Volpina 1, Volpina 2, Volpina 3, Volpina 4 and Volpina 5.

At the end of the high-school he re-started to sail on the Star boat.

During the military period, he took part of the military sailing group.

After that, he spent two years working as a teacher in the same high-school where he has studied.

At the same time he participated to the regatta as semi-professional.

After that, he worked in a mechanical firm in Lecco as production manager and, at the age of 24, he worked as designer of aluminium masts in Canclini company.



CARIBONI



Cariboni's firm was founded in 1984 by Mr Giovanni Cariboni. Thanks to his experience as a sailor, he was able to easily approach to the sailing market world.

In the beginning of his activity, Mr Cariboni was used to design and produce aluminium masts, and this activity was carried on until 1993, when this part of the production has been stopped. In 1987, Cariboni was caught up in its first production of hydraulic components on the boat Masaiomè.

In 1992, Cariboni was involved in the Wallygator project, and this has represented a turning point in the philosophy of the hydraulic system. It was required to fully equip the boat with an hydraulic system. The project was completed in 1994 and the boat is still sailing. From that period Cariboni has concentrated his research and development on the hydraulic system, improving every years its products and its technology.

Nowadays Cariboni is a family business company and it counts around 20 people and 3 freelancers for the installation on board.

All the machinery are connected to the network by a PC where workers can see the 3D of the piece that they are working on.

Our technicians are able to engineer any kind of product thanks to Solidworks, Cosmos and CAM Surfcam.



4

WHERE



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Cariboni's firm in Ronco Briantino is 30 minutes far from **Orio al Serio airport** (Milano-Bergamo) and **Linate** (Milano city airport). The international **Milano Malpensa** hub is 1h 30m far from the company.

Cariboni is open from Monday to Friday,
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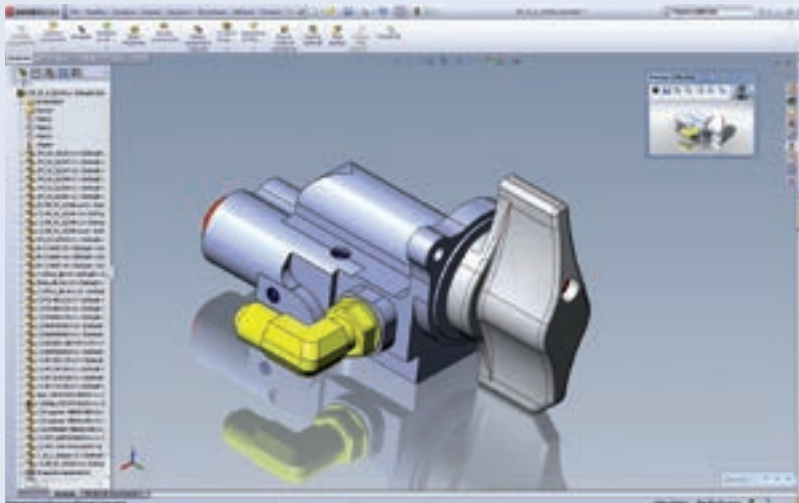


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MANUAL CONTROL



The first manual valve was born in 2000 for AC yachts. Cariboni was the first company which introduced a new concept of manual hydraulic valve, based on pilot logic-elements. Starting from industrial high-tech components, the firm moved a step forward, setting a new benchmark in the marine world.

Designed to work at higher pressure and to have the maximum control and reliability during the race, all manual Cariboni-Caritec valves are made of lightweight hard coated 7075-T651 aluminium body and they are all designed starting from the race know-how got from TP52, AC, VOR 70 and Open60 yachts.

Nowadays Caritec, the manual line of Cariboni, after 10 years of day-by-day development, offers to every kind of sailing boat a complete set of manual controls and a full list of accessories.

Every manual valve has a modular design in order to be easily put in a custom panel with other valves, pumps and accessories.

All manual controls (valves, pumps, accessories) are designed to work up to 700 bar and can be customized with lightweight ABS, aluminium or titanium fittings. All valves have 3 positions: each cylinder can be controlled by its own valve to hold, pump and release.

Cariboni-Caritec offers to customers different type of valves, pumps and accessories based on the same concept, which can be put together in virtual no-end arrangements.

Black line: Cariboni-Caritec standard high flow manual valves for cruise sail boats. All these valves can work up to 700 bar and manage 18lpm oil flow with just a Δp 3 bar. Manual quick release is available for complete systems.

Quad line: manual valves came from the race line, with the same mechanical design but reviewed for cruise-racer sailing boats. Single and double hand pumps can be fitted on manifold for compact manual panel.

Race line: lightness, reliability and top performances are the key words for these kind of valves installed on AC yachts and on most of the TP52 and IRC racing yachts. Lightweight single and double pumps, on line valves and accessories are available for pro racer.

Bagolin line: Cariboni's ultimate solution for manual control.



*Some installation
of the Cariboni's hydraulic
manual system*

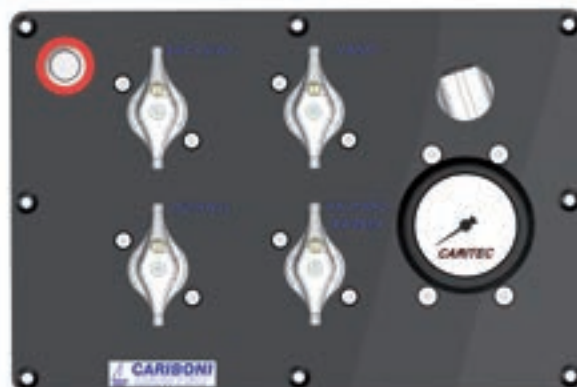


QUAD LINE


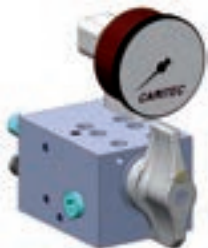

After the experience on 2006 AC races, Cariboni has designed these new manual valves. Starting from the same mechanism of Race line valves, these new valves are designed to offer the best hi-tech manual control for a cruise-race sailing yacht.

Thanks to the special fittings and fixing arrangements, the new Quad valves are used to create a very compact manual panels which can be fitted in every boat. A maximum pressure valve for each function (even for the double valve) improves the reliability of the system and protects the ram and the hoses from overpressure.

As for other Cariboni's valves, each valve is able to control a single acting cylinder with a 3 position control knob (pump-hold-release) and it is available with max pressure valve and manometer gauge. All Quad line valves can run at 700 bar (10.000 PSI) working pressure and up to 8 lpm maximum oil flow. All these valves can be fitted on linear or crossed standard arrangement: custom solutions with manual pump are available on request.



Quad panel: 4 single valve, a manual pump, an analogic manometer and an electric power button in just 300x200mm! A race panel squeezed to the minimum.

VALVE TYPE	MAIN FEATURES	APPLICATION
CM_VSBC_A_12322 	Max working pressure: 700 bar (10.000PSI) Weight: 0,76kg (1,68lbs) Max oil flow: 8lpm Black hard coated aluminium Hold-pump-release positions 20-700 bar max adjustable max pressure valve Flow release control 7/16" JIC UNF 37° stainless steel fitting* Polished stainless steel knob available on request	Single valve with max pressure valve Single acting cylinder (backstay, forestay, inner forestay, halyard, outhaul, Cunningham etc.) Single acting boom vang Back-up valve in automatic hydraulic system
CM_VSBC_A_08814 	Max working pressure: 700 bar (10.000PSI) Weight: 0,84kg (1,85lbs) Max oil flow: 8lpm Black hard coated aluminium Hold-pump-release positions 20-700 bar max adjustable max pressure valve 0-600 bar analogical pressure gauge 7/16" JIC UNF 37° stainless steel fitting* Polished stainless steel knob available on request	Single valve with max pressure valve and manometer Single acting cylinder (backstay, forestay, inner forestay, halyard, outhaul, Cunningham etc.) Single acting boom vang Back-up valve in automatic hydraulic system
CM_VD_A_08897 	Max working pressure: 700 bar (10.000PSI) Weight: 1,09kg (2,41lbs) Max oil flow: 8lpm Black hard coated aluminium Hold - pump A - pump B positions 20-700 bar max adjustable max pressure valve Flow release control 7/16" JIC UNF 37° stainless steel fitting both for A and B port* Polished stainless steel knob available on request	Double valve Double acting cylinder Double acting boom vang Transom door system Lifting keel manual back-up Canting keel manual back-up Max pressure valve on A and B port

*Custom fittings available on request (1/4" BSPP – 9/16" JIC UNF 37° - 3/8" BSPP)

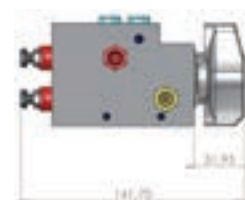
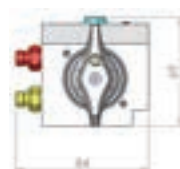
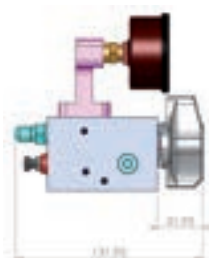
All valve types can be placed on linear or crossed aluminium manifold for standard or custom manual panel

QUAD LINE

QUAD LINE VALVE - MAIN DIMENSIONS

Single valve model with max pressure valve and manometer gauge

Double valve model



Quad line PANELS

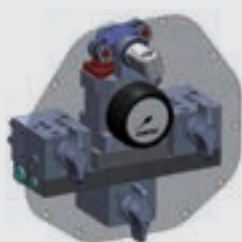
Quad line panels are the CARIBONI-CARITEC compact offer for race-cruising yachts. Thanks to the new valve design, Quad panels are very compact and can be installed on any kind of boat.

Shape and dimensions depend on the number of valves and pressure gauges installed on it. We offer a slim 2 valves panel (single valve, double or mixed), a BP3, BP4, BP5 (3, 4 or 5 single valves) or custom solution with 10 valves or more on the same panel. A QUAD LINE single or double manual pump (see "Manual Pump" paragraph for further information) can be added on every panel.

The Quad panels are made on black hard coated aluminium; custom polished stainless steel and carbon fibre panels are available on request.

Each manual panel is available with electric pump power supply, able to achieve 700 bar.

Quad panels are designed to work with pressurized oil tank in order to increase the pumping performances and the layout flexibility of the system.



Baltic 45'
Design by Reichel Pugh

Equipped with custom Cariboni manual quad Panel to control vang, outhaul and Cunningham hydraulic rams



RACE LINE

The best choice for all racing yachts is the race line. The body is made of 7075-T651 hardcoated aluminium fully machined for extreme weight saving. These valves have been tested on AC, STP 65 and TP52 yachts and ocean race boats.

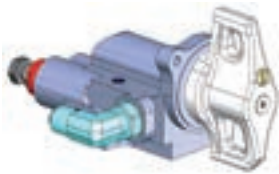
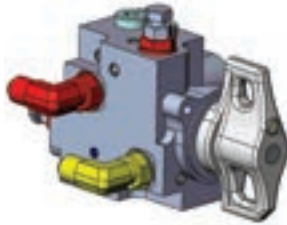
As for other Cariboni's valves, each valve is able to control a single acting cylinder with a 3 position control knob (pump-hold-release).

All Race line valves can run over 700 bar (10.000 PSI) working pressure and up to 8 lpm maximum oil flow; they can be fitted on linear or crossed standard arrangement with lightweight manifold.

All race line valves can be supplied with servo controls.



*Luna Rossa catamaran
manual valves, pumps and titanium rams.*

VALVE TYPE	MAIN FEATURES	APPLICATION
CM_VSBC_A_12254 	Max working pressure: 700 bar (10.000PSI) Weight: 0,311kg (0,685lbs) Max oil flow: 8lpm Hard coated aluminium Hold-pump-release positions Relief pressure valve incorporated Flow release control 7/16" JIC UNF 37° stainless steel fitting*	Single valve with max pressure valve It can be used to run every kind of single acting cylinder on race sailing yachts.
CM_VD_A_14744 	Max working pressure: 700 bar (10.000 PSI) Weight: 0,560kg (1,234lbs) Max oil flow: 8lpm Hard coated aluminium Hold – pump A – pump B positions Relief pressure valve incorporated Flow release control 7/16" JIC UNF 37° stainless steel fittings*	Double valve with max pressure valves Double acting cylinders Lifting keel manual back-up Canting keel manual back-up

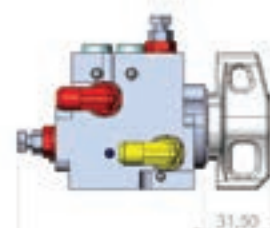
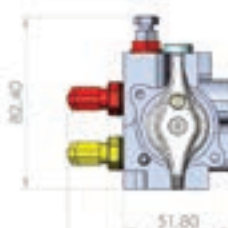
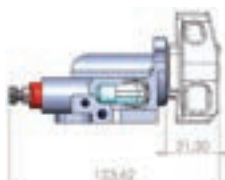
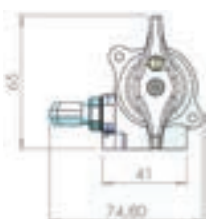
* Custom fittings available on request (1/4" BSPP – 9/16" JIC UNF 37° - 3/8" BSPP) **also in titanium alloy**

All valves types can be placed on linear or crossed lightweight aluminium manifold

MAIN DIMENSIONS

Single valve model with max pressure valve

Double valve model with max pressure valves







RACE LINE

RACE LINE VALVES PANELS & ARRANGEMENTS

Single and double valves can be placed on lightweight ergal 7075-T651 manifold for linear or crossed arrangements. Each arrangement is supplied with stainless steel fittings: aluminum or titanium fittings available on request.



Race line panels are designed to have pressurized suction and return lines and can be equipped with electric power pump back-up for maximum performances.

TYPE	NUMBER OF VALVES	WEIGHT
LINEAR ARRANGEMENT 	From 1 to 5 single or double valve as preferred, with or without max pressure valve	Weigh for position (a valve for each, single or double): 1 pos: 0,086 kg (0,19 lbs) 2 pos: 0,187 kg (0,41 lbs) 3 pos: 0,283 kg (0,62 lbs) 4 pos: 0,379 kg (0,84 lbs) 5 pos: 0,475 kg (1,05 lbs)
CROSSED ARRANGEMENT 	From 1 to 8 single or double valve as preferred, with or without max pressure valve	Weigh for position (a valve for each, single or double): 1 pos: 0,086 kg (0,19 lbs) 2 pos: 0,187 kg (0,41 lbs) 3 pos: 0,270 kg (0,6 lbs) 4 pos: 0,370 kg (0,82 lbs) 5 pos: 0,440 kg (0,97lbs) 6 pos: 0,539 kg (1,19 lbs) 7 pos: 0,610 kg (1,34 lbs) 8 pos: 0,710 kg (1,57 lbs)

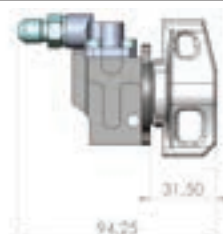
BAGOLIN LINE

After the presentation at the 2010 Mets Exhibition, several tests confirmed the efficiency of this new generation of manual race valves, the Bagolin valves.

The valves can be assembled in different ways: one/two/three in line. With the new manual knob, the release speed can be easily controlled.

VALVE TYPE	MAIN FEATURES	APPLICATION
BAGOLIN CM_VS_A_21284 	Max working pressure: 700 bar (10.000 PSI) Weight: 0,174kg (0,384lbs) Max oil flow: 6lpm Hard coated aluminium Hold – pump – release positions Manual release control 7/16" JIC UNF 37° stainless steel fittings*	It can be used to run every kind of single acting cylinder on race sailing yachts Each valve can be supplied with a servo actuator
BAGOLON CM_VS_A_17807 	Max working pressure: 700 bar (10000 psi) Weight: 0,195 kg (0.43 lbs) Max oil flow: 12 lpm Hard coated aluminium Hold – Pump – release positions Manual release control 7/16 UNF JIC 37° stainless steel fittings*	Each valve can be supplied with a servo actuator

* Custom fitting available on request also made of titanium alloy


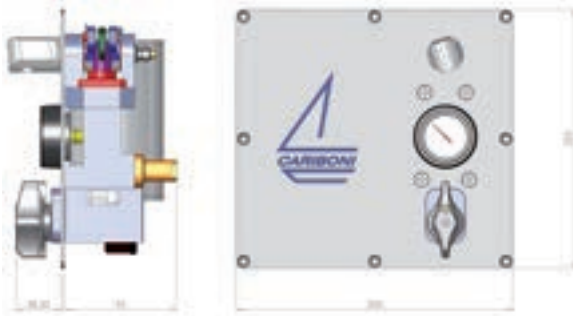


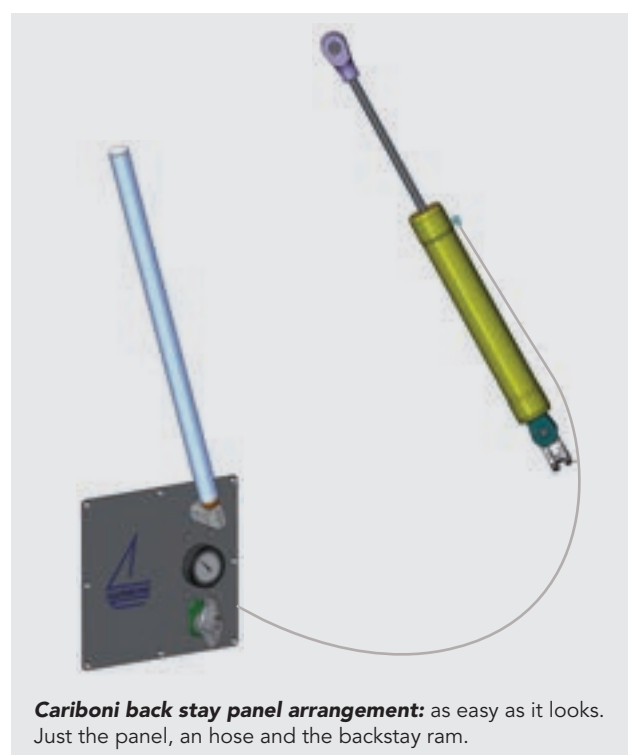
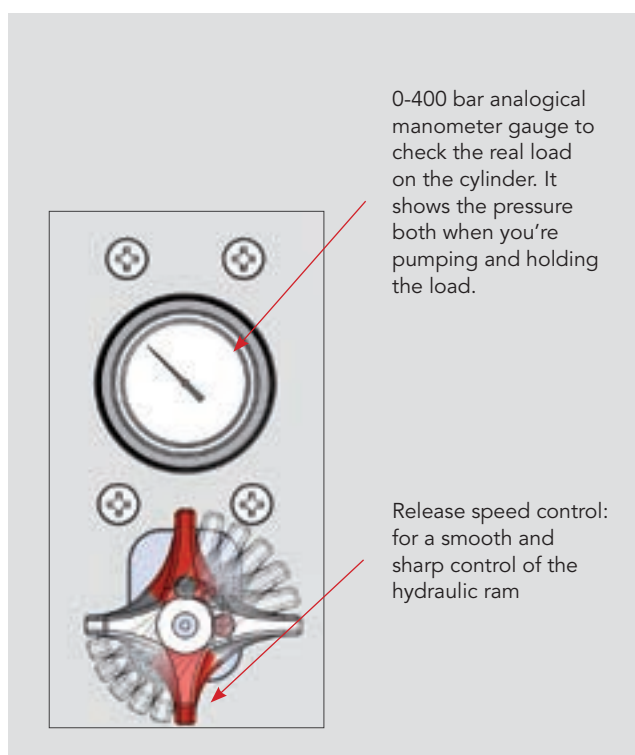


MANUAL PANELS

Our manual panels start from a single valve system, and it can be added the number of valves needed. Panels are made of lightweight aluminium alloy, but also carbon fibre or stainless steel panels are available on request. Here be-

low an example of custom manual panel, the IPA 1225 A 04417 which matches together a double speed pump and a custom single acting valve. This minimize dimensions and weight of the system.

TYPE	DESCRIPTION
IPA_1225_A_04417 	<p>To drive single acting cylinder of Decision 35 catamaran mainsheet</p> <p>Quad line double speed pump, with auto shift and max pressure valve.</p> <p>Displacement: 3.6 cc (high pressure), 25.1 cc (high flow)</p> <p>Release speed control</p> <p>45° pump handle movement</p> <p>Dimensions: 150 x 250 mm</p> <p>Weight: 4.580 kg (10.1 lbs)</p>
IPA_0416_A_12293 	<p>This extra-compact panel is the new Cariboni's smart idea for small-medium sailing yacht to safety control the backstay.</p> <p>Just 446x416mm for:</p> <ul style="list-style-type: none"> - Single speed alternate pump with max pressure valve - Release speed control valve - 0-400 bar analogical manometer - Up to 3 litres pressurized oil tank for varying backstay size (from 30' to 65' yacht size)



IN-LINE VALVES

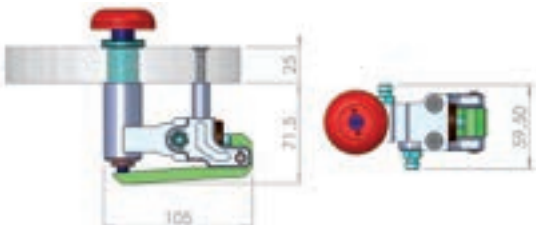
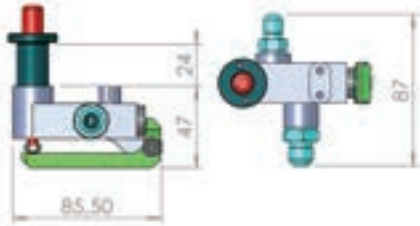
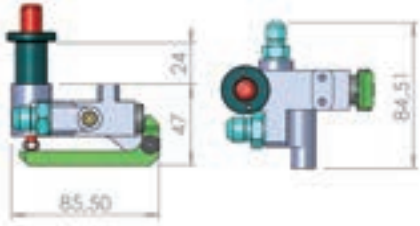
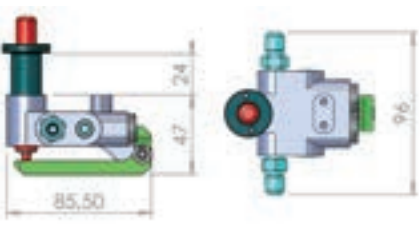
Cariboni-Caritec hydraulic equipment includes several types of in-line valves in order to satisfy any needs of cruiser and racer sailing yacht. All in-line valves are made of hard coated 7075-T651 aluminium and they are all designed to work at 700 bar (10.000 PSI).

Please contact our technical office for further informations: we are glade to provide you technical support in order to design an efficient, reliable and lightweight hydraulic system.

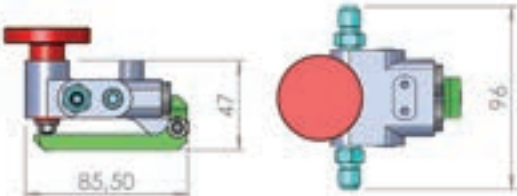
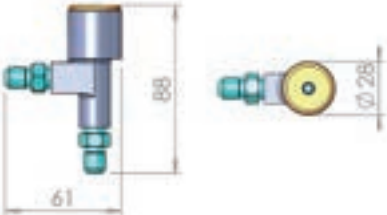
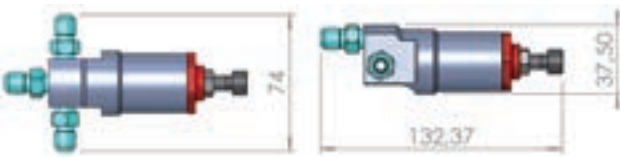
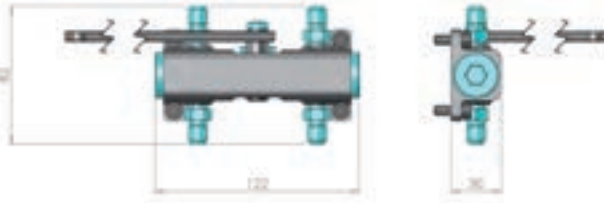
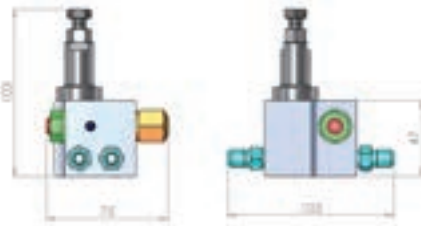
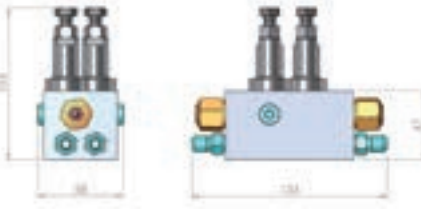
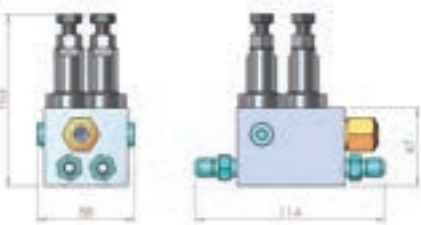
Each in-line valve is equipped with stainless steel fittings: extreme weight reduction can be achieved with optional titanium and aluminum fittings.



Installation of in-line valves

TYPE	MAIN FEATURES & APPLICATION
	<p>Black line quick release valve (P to T line) Black hard coated aluminum 7075 Weight: 0,38kg (0,84lbs) Max working pressure: 700bar (10.000PSI)</p> <p><i>Main applications: boom vang fast release, travelers, runners etc.</i></p>
	<p>Race line quick release (P to T line) Hard coated aluminum 7075 Weight: 0,235kg (0,52lbs) Max working pressure: 700bar (10.000PSI) It can work with pressurized oil tank.</p> <p><i>Main applications: boom vang fast release, travelers, runners etc.</i></p>
	<p>Race line quick release (P to T line) with flow control (you can reduce the release speed) Hard coated aluminum 7075 Weight: 0,286kg (0,63lbs) Max working pressure: 700bar (10.000PSI) It can work with pressurized oil tank.</p> <p><i>Main applications: back-up release valve for every cylinders</i></p>
	<p>Race line by-pass valve (A to B and B to A). Hard coated aluminum 7075 Weight: 0,260kg (0,57lbs) Max working pressure: 700bar (10.000PSI) It can work with pressurized oil tank.</p> <p><i>Main applications: fast release for double acting cylinders, traveler fast release</i></p>




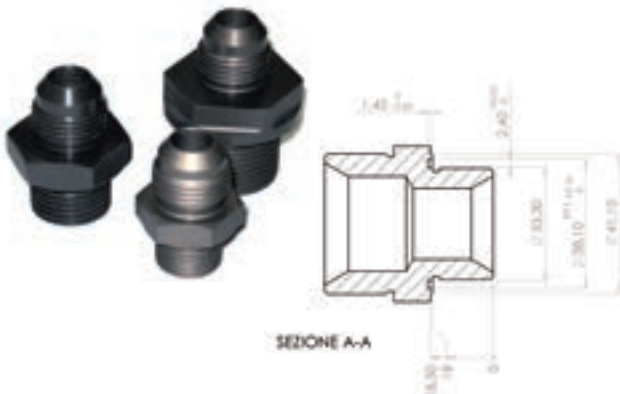
IN-LINE VALVES

PUMP TYPE	MAIN FEATURES & APPLICATION
	<p>Race line link valve (A to B and B to A). Hard coated aluminum 7075 Weight: 0,52kg (1,15lbs) Max working pressure: 700bar (10.000PSI) It can work with pressurized oil tank.</p> <p><i>Main applications: to put together to pressure line in hydraulic system</i></p>
	<p>Flow control valve (restriction from A to B. Flow is free from B to A). Black hard coated aluminum Weight: 0,18kg (0,39lbs) Max working pressure: 700bar (10.000PSI) It can work with pressurized oil tank.</p> <p><i>Main applications: release speed control in single and double acting cylinder.</i></p>
	<p>Max pressure valve (reduce max pressure line) Hard coated aluminum 7075 Weight: 0,25kg (0,55lbs) Max working pressure: 700bar (10.000PSI) It can work with pressurized oil tank.</p> <p><i>Main applications: max pressure control in hydraulic system or in single/double acting cylinders.</i></p>
	<p>Manual By-pass valve Hard coated aluminum 7075 Weight: 0,51kg(1,12lbs) Max working pressure: 700bar (10.000PSI) Top flow Up to 50lpm</p> <p><i>Main applications: by-pass valve to let move freely under load two twin cylinders</i></p>
	<p>Single anti-shock valve Hard coated aluminum 7075 Weight: 0,45kg (1lbs) Max working pressure: 700bar (10.000PSI)</p> <p><i>Main applications: for every double acting cylinder which can hold impulsive load. Adjustable anti-shock release speed. It reduces the peaks of pressure inside the ram (pressure moves from back port to head port of the ram).</i></p>
	<p>Double anti-shock valve for double acting cylinder Hard coated aluminum 7075 Weight: 0,75kg (1,65lbs) Max working pressure: 700bar (10.000PSI) It can work with pressurized oil tank.</p> <p><i>Main applications: for every double acting cylinder which can hold impulsive load. It reduces the peaks of pressure inside the ram (pressure moves from back port to head port of the ram).</i></p>
	<p>Double anti-shock valve for double acting cylinder (with same oil volume on head and back). Hard coated aluminum 7075 Weight: 0,65kg (1,43lbs) Max working pressure: 700bar (10.000PSI) It can work with pressurized oil tank.</p> <p><i>Main applications: for every double acting cylinder which can hold impulsive load. It reduces the peaks of pressure inside the ram (pressure moves from back port to head port of the ram).</i></p>

HYDRAULIC ACCESSORIES


As a wise man said: "Beauty is in the details". Every hydraulic system needs some small parts which are as important as the other "big" parts. Fittings, filters, gauges, hoses,

through deck glands etc. are all parts of Cariboni's accessories catalogue.


PRODUCT	DESCRIPTION																								
Pressure gauges and sensors 	<p>Digital and analogical Ø50mm gauge can be fitted in any sort of hydraulic system to monitor the line pressure or the hydraulic ram working load.</p> <p>The electronic pressure gauge, available both on 0-5V and 4-20mA signal, are used for Caritec electronic manometer, B&G instruments, PLC instruments and for Cariboni Monitoring system.</p>																								
Online filters 	<p>Cariboni oil filters are designed to work with manual system keeping low pressure drop even at high flow.</p> <p>The filter houses are full made in lightweight aluminium and the cartridges can be replaced easily.</p> <p>Cariboni high flow filter can be used in electric return line thanks to its high flow rate.</p>																								
Through deck glands 	<p>Cariboni's through deck glands are designed for Parker N3, N4, N6 and N8 hoses. These kind of hoses are the most common ones in cruising boats and copy every kind of needs.</p> <p>With the Cariboni deck glands, you don't need to cut the hoses and add new fitting: just fit the glands on the hoses.</p> <p>Less fittings means less chance to have oil leakages.</p> <p>Through deck glands are available in standard aluminium alloy or in polished stainless steel. Custom dimensions are available on demand.</p>																								
Aluminum lightweight fittings 	<p>Aluminum lightweight fittings are designed for pure racer yachts in order to reduce to the minimum the overall weight of the hydraulic system (you know, everything counts!)</p> <table border="0"> <tr> <td>1/8" BSPP+OR – 7/16" JIC 37°</td><td>(weight: 0,006 kg)</td></tr> <tr> <td>1/4" BSPP+OR – 7/16" JIC 37°</td><td>(weight: 0,010 kg)</td></tr> <tr> <td>3/8" BSPP+OR – 7/16" JIC 37°</td><td>(weight: 0,014 kg)</td></tr> <tr> <td>1/4" BSPP+OR – 9/16" JIC 37°</td><td>(weight: 0,010 kg)</td></tr> <tr> <td>3/8" BSPP+OR – 9/16" JIC 37°</td><td>(weight: 0,014 kg)</td></tr> <tr> <td>1/2" BSPP+OR – 9/16" JIC 37°</td><td>(weight: 0,022 kg)</td></tr> <tr> <td>3/4" BSPP+OR – 9/16" JIC 37°</td><td>(weight: 0,042 kg)</td></tr> <tr> <td>3/8" BSPP+OR – 3/4" JIC 37°</td><td>(weight: 0,016 kg)</td></tr> <tr> <td>1/2" BSPP+OR – 3/4" JIC 37°</td><td>(weight: 0,024 kg)</td></tr> <tr> <td>3/4" BSPP+OR – 3/4" JIC 37°</td><td>(weight: 0,044 kg)</td></tr> <tr> <td>3/4" BSPP+OR – 3/4" BSPP SW.</td><td>(weight: 0,06444 kg)</td></tr> <tr> <td>1" BSPP+OR – 1" BSPP SW.</td><td>(weight: 0,094kg)</td></tr> </table> <p>Same sizes are available made on titanium alloy too.</p>	1/8" BSPP+OR – 7/16" JIC 37°	(weight: 0,006 kg)	1/4" BSPP+OR – 7/16" JIC 37°	(weight: 0,010 kg)	3/8" BSPP+OR – 7/16" JIC 37°	(weight: 0,014 kg)	1/4" BSPP+OR – 9/16" JIC 37°	(weight: 0,010 kg)	3/8" BSPP+OR – 9/16" JIC 37°	(weight: 0,014 kg)	1/2" BSPP+OR – 9/16" JIC 37°	(weight: 0,022 kg)	3/4" BSPP+OR – 9/16" JIC 37°	(weight: 0,042 kg)	3/8" BSPP+OR – 3/4" JIC 37°	(weight: 0,016 kg)	1/2" BSPP+OR – 3/4" JIC 37°	(weight: 0,024 kg)	3/4" BSPP+OR – 3/4" JIC 37°	(weight: 0,044 kg)	3/4" BSPP+OR – 3/4" BSPP SW.	(weight: 0,06444 kg)	1" BSPP+OR – 1" BSPP SW.	(weight: 0,094kg)
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HYDRAULIC ACCESSORIES

PRODUCT	DESCRIPTION
Cariboni custom tools 	<p>Cariboni designs and machines standard and custom tools to service its own products and other system with Hawe components. We can also supply every kind of tools to easy service our products. Seal kits, spare parts and every kind of parts are available on demand for a complete service package.</p>

HYDRAULIC ACCESSORIES / HOSES

		HIGH PRESSURE HOSES High pressure hoses with Kevlar reinforcement. For top hydraulic systems with extreme lightweight specifications.					
MODEL	I.D. mm	O.D. mm	Rmin mm	W.P. bar	B.P. bar	Weight kg/m	Fitting
6700	4,0	8,0	40	500 (7.200PSI)	1500	0,04	7/16" UNF JIC 37°
0461 VHP	5,0	11,0	30	700 (10.000PSI)	2800	0,09	7/16" UNF JIC 37°
2A DN 10	10,0	19,5	152	700 (10.000PSI)	2080	0,25	9/16" UNF JIC 37°
2A DN 13	13,0	22,6	203	410 (6.000PSI)	1640	0,35	3/4" UNF JIC 37°

		CARBON FIBER HOSES					
MODEL	I.D. mm	O.D. mm	Rmin mm	W.P. bar	B.P. bar	Weight kg/m	Fitting
A02311-2T/C 3/16"	4,8	7,5	30	700 (10.000PSI)	1600	0,028	7/16" UNF JIC 37°
A02312-2 T/C 1/4"	6,4	10,2	40	700 (10.000PSI)	1600	0,055	7/16" UNF JIC 37°
A02313-3T/C 3/8"	7,9	14	50	500 (7.200PSI)	1500	0,112	9/16" UNF JIC 37°
A02315-3 T/C 1/2"	8,5	18	75	400 (5.800PSI)	1200	0,135	3/4" UNF JIC 37°
A02316-4 T/C 3/4"	17,5	25	140	400 (5.800PSI)	1200	0,250	3/4" BSP

HYDRAULIC ACCESSORIES / OIL TANKS

We design and machine aluminium and carbon fiber oil tanks complete with accessories, air pressure gauges, fittings and oil level.

For race-cruiser and pure racer sailing yachts, we offer light-weight carbon fiber oil tanks in different sizes and custom arrangements.

Carbon fiber oil tanks are available in 3 different size and capacity:

- SCP_2.1: 2.1 liters, L=250mm
- SCP_5.1: 5.1 liters, L=600mm
- SCP_9.4: 9.4 liters, L=850mm



Carbon fibre oil tanks: 2,5 and 9 litres volume.
On the right: custom arrangements for VOR 70



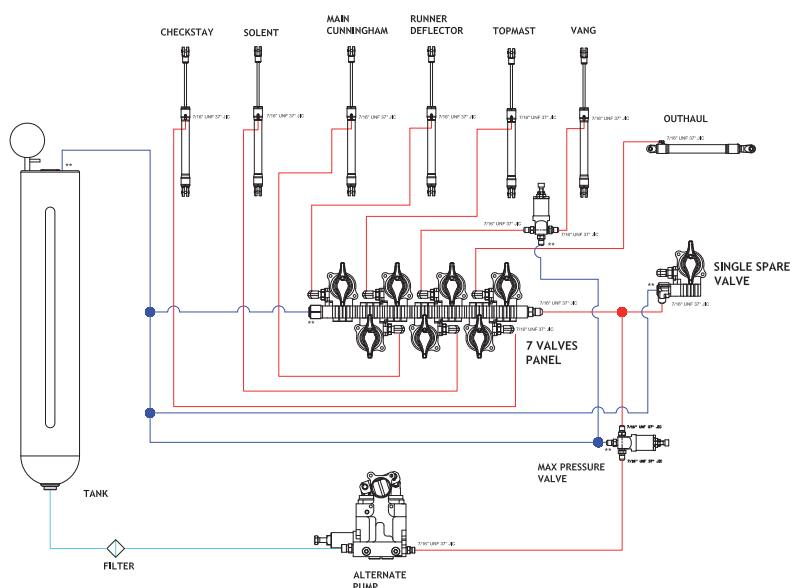
Standard pressurized oil tanks,
2 and 4 litres volume

Custom pressurized carbon
fibre oil tank, 8 litres volume



Custom pressurized carbon fibre oil tank with piston. 4,5 and
10 litres volume

MANUAL SYSTEM

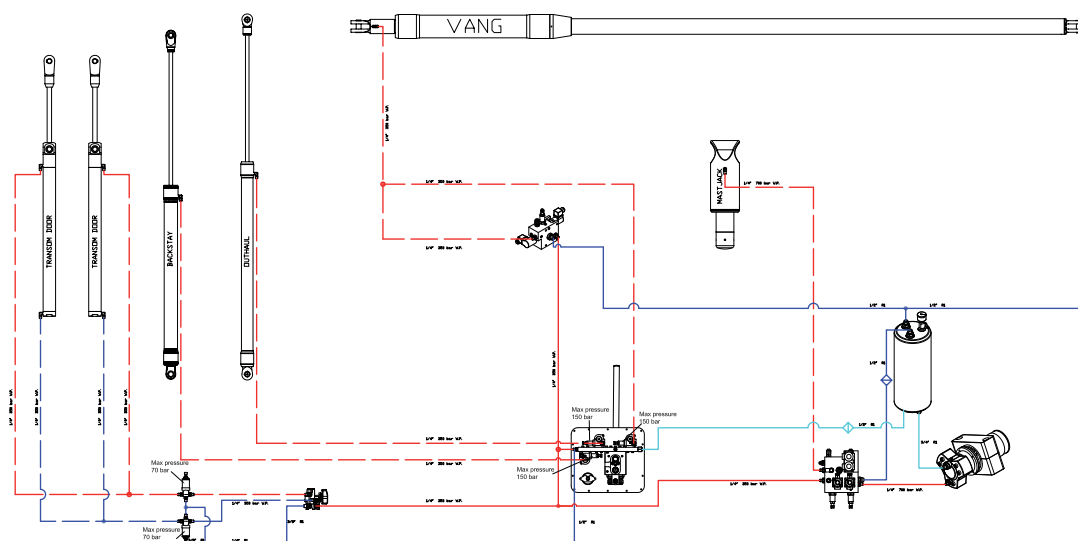


An example of a manual hydraulic deck equipment.

Cariboni can design and supply on request a complete hydraulic system, including all accessories like piping and fittings. The system is tested to assure that the connected components run smoothly. Cariboni's technicians are available to install hydraulic systems or to overlook the installation at the shipyard.



72' Alegre



The hydraulic system of a 65' cruising yacht with manual and electric system all in one.

An example of Cariboni's installation. Each hose is named and its path is as linear as possible, reducing weight and increasing performance and reliability.



Single and double valves in assembly&test area. Cariboni manual hydraulic components are all designed for 700 bar (10.000psi) working pressure and they are tested till their limits one by one.



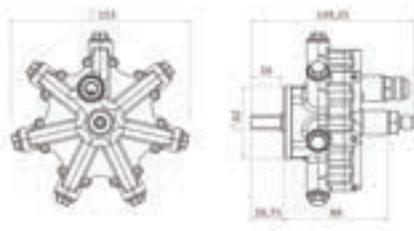
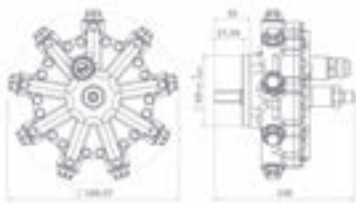
ROTARY PUMPS

Cariboni's pedestal pumps have changed the hydraulics for cruise-racer and racer yachts. This kind of pump is compact and lightweight and can be arranged on coffer grinder to give highest performances and complete integration with winch handles.

Here below you can see the overall view of our radial pumps and their features.

Cariboni's radial pistons pump can be placed on cockpit to be driven by winch handle or under the deck for a coffee grinder arrangement.

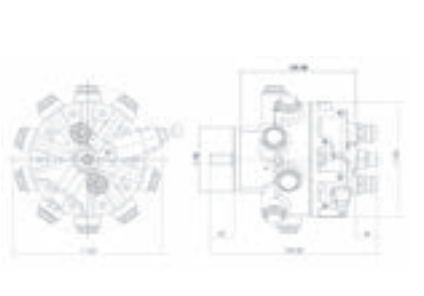
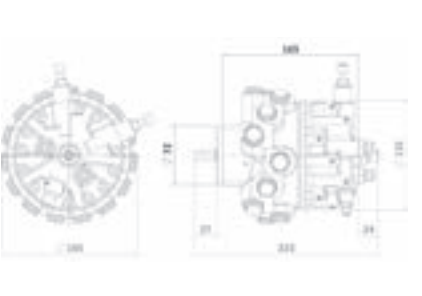
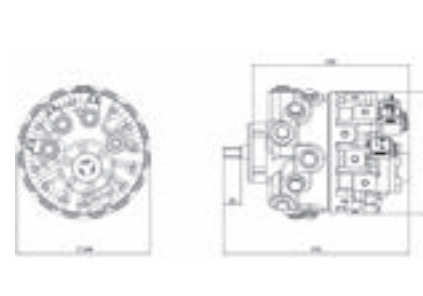
The careful design of each component always gives smooth and comfortable rotary movements, without any hard step for the grinder. The pump is self-priming and gives oil at the first 1/5 or 1/16 round (depending on the pump type).

TYPE		IPR 7	IPR 9	
				
DESCRIPTION		7 radial pistons Hard coated 7075 T6 aluminium alloy	9 radial pistons Hard coated 7075 T6 aluminium alloy	
PERFORMANCE	Working pressure	700 bar (10000 PSI)	600 bar (8700 PSI)	
	Weight	1,35 kg (2,98 lb)	2 kg (4,41 lb)	
	Tot oil flow per turn	7,69 cc	12.2 cc	
	Dim ø	153x88 mm	168x110.5 mm	



ROTARY PUMPS



IPR 10	IPR 15	IPR 15 – 350
		
<p>10 radial pistons, 2 speed (*) Hard coated 7075 aluminium alloy. Autoshift system with adjustable valve. Relief valve incorporated.</p>	<p>15 radial pistons, 3 speed (*) Hard coated 7075 aluminium alloy. Autoshift system with adjustable valve. Relief valve incorporated.</p>	<p>15 radial pistons, 7 speed Hard coated 7075 aluminium alloy. Shift system actuated by integrated solenoid valves. Speed can be changed by the user. Relief valve incorporated.</p>
700 bar (10.000 PSI)	700 bar (10.000 PSI)	350 bar (5.000 PSI)
2,8 kg (6,17 lb)	5,8 kg (12,79 lb)	7,8 kg (17,20 lb)
16,54 cc (second speed) 5,09 cc (first speed)	23,46 cc (third speed) 12,01 cc (second speed) 5,09 cc (first speed)	66,70 cc (seventh speed) 54,66 cc (sixth speed) 43,90 cc (fifth speed) 34,80 cc (fourth speed) 31,80 cc (third speed) 22,80 cc (second speed) 12,05 cc (first speed)
165x129,5 mm	165x165 mm	198x233 mm



(*) you can have option with electro valve

HYDRAULIC CYLINDERS



In worldwide sail competitions, Cariboni has led the design of the ultimate hydraulic cylinders for both race and fast cruisers boats.

An hydraulic ram seems to be an easy piece, but there are some features which set a gap between a good product and the best product ever. Cariboni faces rams design with a pure technical approach. Each ram is unique but all of them are designed considering:

Reliability

Real marine environment is worse than any testing ground. During hard sailing, rams are stressed by many factors, which have all to be considered in the design.

Lightness

Less weight on board helps to sail faster and with more efficiency even if the boat is just cruising. We don't mind if the ram is for a regatta boat or for a cruising one.

We don't want a single gram of weight more than necessary on your boat.

Sailing approach

We give more and more attention to functions and to how the single piece is integrated on the boat.

After 25 years, more than 250 different types of cylinders have been designed.

Aluminium, stainless steel or titanium tubes, single or double acting cylinders, from 2000 up to 10.000 PSI working pressure, from few kgs up to 358000kg of working load.



JP 54 cruising boat

Cariboni has supplied all the hydraulics system and the rams for the vang, canting keel and the rams for the rotating live cell.



Botin 65 Caro



B42 day sailing yacht. Halyard, main track and mainsheet are all driven by Cariboni's aluminium rams.

STANDARD SINGLE ACTING CYLINDERS

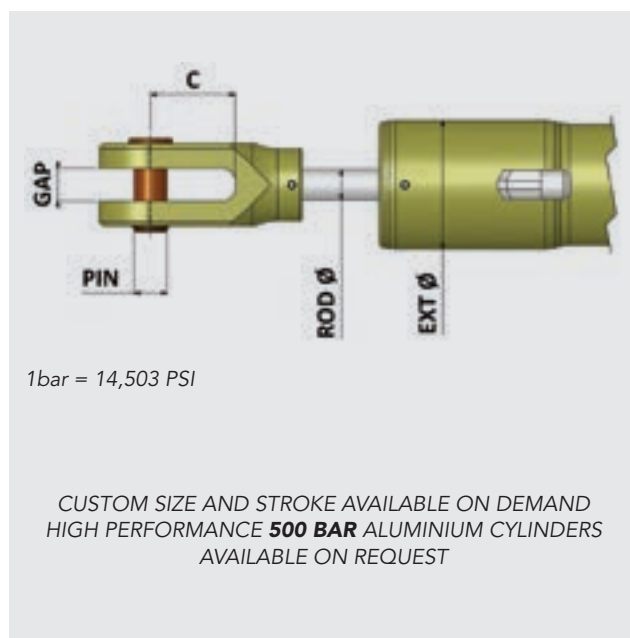
Our standard single acting cylinders are available in different kind of models in stock or with short delivery time. The cylinders are all supplied with standard rod and tube clevis terminals. Custom terminals are available on request (lashing, marine eye, pulley, tackle, etc...).

Tubes and terminals are made of black hard coated aluminium alloy (6082); rods are made of Nitronic 50 and pins are made of 17-4PH stainless steel. All our cylinders have return spring air to easily release the load. Complete seal kits and service tools are available on request.

Notes:

(1) Maximum pull working load at 350 bar with no gas pressure

(2) Rod and tube terminal have the same pin&gap dimensions



SIZE	CARIBONI MODEL	Max pull load @ 350bar ⁽¹⁾		
		kg	lb	
5	CL 019 S 0250			
	CL 019 S 0400	608	1341	
	CL 019 S 0500			
6	CL 025 S 0270			
	CL 025 S 0350	1348	2971	
	CL 025 S 0570			
7	CL 030 S 0250			
	CL 030 S 0350	2118	4670	
	CL 030 S 0570			
10	CL 035 S 0250			
	CL 035 S 0380	3029	6678	
	CL 035 S 0570			
12	CL 040 S 0250			
	CL 040 S 0380	3766	8303	
	CL 040 S 0570			
17	CL 045 S 0250			
	CL 045 S 0400	4957	10928	
	CL 045 S 0600			
20	CL 050 S 0280			
	CL 050 S 0400	6288	13863	
	CL 050 S 0600			
23	CL 055 S 0300			
	CL 055 S 0400	7356	16216	
	CL 055 S 0600			
28	CL 060 S 0300			
	CL 060 S 0450	8967	19768	
	CL 060 S 0700			
32	CL 070 S 0350			
	CL 070 S 0450	11979	26409	
	CL 070 S 0700			
50	CL 080 S 0450			
	CL 080 S 0600	16182	35676	
	CL 080 S 1000			
60	CL 090 S 0450			
	CL 090 S 0650	20175	44478	
	CL 090 S 1000			
86	CL 100 S 0450			
	CL 100 S 0600	25499	56216	
	CL 100 S 1000			
110	CL 115 S 0500			
	CL 115 S 0700	33626	74131	
	CL 115 S 1100			
160	CL 140 S 0500			
	CL 140 S 0700	50438	111197	



STANDARD SINGLE ACTING CYLINDERS

	Max yield load		Gap & Pin ⁽²⁾	C	Rod Ø	Ext Ø	Stroke	L min (pin-to-pin)	Dry weight	Oil volume
	kg	lb	mm	mm	mm	mm	mm	mm	kg	litres
	3865	8521	11,2	27	12	31	250	544	0,9	0,04
							400	693	1,0	0,07
							500	794	1,2	0,09
	3865	8521	11,2	27	12	38	270	559	1,3	0,10
							350	659	1,4	0,13
							570	909	1,6	0,22
	5631	12414	12,7	35	12	44	250	557	1,5	0,15
							350	674	1,8	0,21
							570	814	2,3	0,34
	5631	12414	12,7	35	12	49	250	528	1,7	0,21
							380	680	2,0	0,32
							570	902	2,4	0,48
	7738	17059	16	38	16	52	250	574	2,3	0,26
							380	721	2,6	0,40
							570	947	3,0	0,60
	10650	23479	16	38	16	58	250	528	2,6	0,35
							400	703	3,4	0,56
							600	937	3,7	0,83
	10650	23479	19	43	16	60	280	573	3,4	0,49
							400	705	4,7	0,70
							600	925	4,9	1,06
	14028	30926	19	47	20	76	300	610	5,1	0,62
							400	720	5,8	0,82
							600	940	7,2	1,24
	17870	39397	19	49	20	86	300	655	5,9	0,75
							450	820	6,7	1,13
							700	1095	8,2	1,76
	26946	59406	22,2	57	25	94	350	720	9,4	1,18
							450	830	10,6	1,51
							700	1105	13,6	2,35
	29505	65047	25,4	57	25	108	450	873	13,5	2,04
							600	1038	15,6	2,72
							1000	1478	23,0	4,54
	44043	97098	31,8	63	30	122	450	940	20,0	2,51
							650	1160	24,0	3,62
							1000	1545	31,0	5,57
	44043	97098	31,8	67	30	128	450	995	18,5	3,18
							600	1160	21,2	4,24
							1000	1600	28,5	7,06
	61483	135547	40	70	35	145	500	1130	28,6	4,71
							700	1355	31,8	6,60
							1100	1795	39,6	10,37
	81825	180393	45	80	40	174	500	1380	37,7	7,07
							700	1675	42,7	9,90

DOUBLE ACTING CYLINDERS

Double acting cylinders are used to control a movement under load both in pull and push mode. We design and machine a wide number of double acting cylinders to satisfy customer's needs.

An extra attention must be paid when you're thinking of a double acting cylinder: when pushing, the rod of the cylinder is affected by a "buckling effect", which depends on the rod length and the material which it is made of. For this reason, double acting cylinders usually have a bigger rod diameter and they're custom designed.

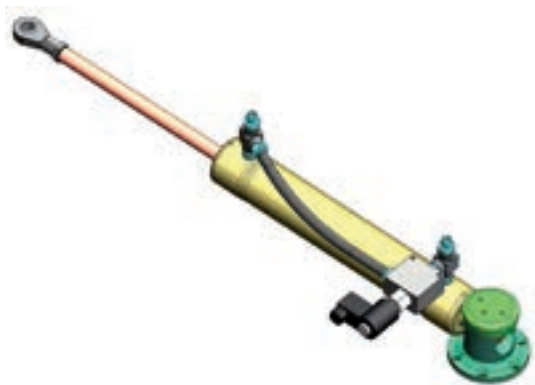
Here below a short list of double acting cylinders manufactured by Cariboni-Caritec for fast cruiser and race sailing yachts: steering cylinder, mast base control, lifting keel locking pin, transom door, bimini control and many other applications.

Custom models and linear sensor are available on request.



Double acting cylinder with integrated linear sensor to control foil angle of 32' race catamaran.

MODEL	Max pull load		Max push load		Stroke		W.P.		Notes
	kg	lb	kg	lb	mm	in	bar	psi	
CL 016 D 0160	215	474	105	231	160	6,30	140	2000	Aluminium & Nitronic
CL 019 D 0065	731	1611	1445	3186	65	2,56	500	7250	Ergal & Titanium
CL 025 D 0170	1034	2280	1200	2646	170	6,69	350	5000	Aluminium & Nitronic
CL 035 D 0546	1186	2616	700	1543	546	21,5	200	2900	Stainless steel & Nitronic
CL 055 D 0470	8500	18739	12109	26696	470	18,5	500	7250	Aluminium & Nitronic
CL 080 D 0600	10350	22818	10350	22818	600	23,6	250	3625	Aluminium & Nitronic
CL 135 D 0578	42600	93917	51068	112586	578	22,8	350	5000	Titanium & 17-4 PH
CL 180 D 0041	59845	131936	64850	142970	41	1,61	250	3625	Stainless steel & Nitronic



Aluminium double acting cylinder for hydraulic steering system. 55 mm I.D. for 300 mm stroke. Over 5000 kg at 250 bar. On board by-pass valve for manual control. Installed on 75' luxury sailing yachts.



Double acting cylinder to control the mast base position. Made of aluminium, rod and tube terminal made of 17-4PH.

MAST JACK CYLINDERS

Mast jack cylinders are used to pre-tension the rig. We design and produce stainless steel mast jack cylinders to be integrated in the mast base.

They can be placed with the bottom on a base, or upside down.

The mast-jack cylinders are usually made of 17-4PH stainless steel and designed to work at 700 bar (10.000 PSI).

Lightweight mast jack cylinders are available for racing yachts.

Custom models are available on request.



MODEL	Working load		Stroke		Outside Ø		Rod Ø		Bore		Working pressure		Notes
	kg	lb	mm	in	mm	in	mm	in	mm	in	bar	psi	
CL 060 S 0040	20000	44092	40	1.57	85	3.35	56	2.20	60	2.36	700	10.000	Aluminium. Weight: 4kg
CL 080 S 0125	35000	77161	125	4.92	100	3.95	60	2.36	80	3.15	700	10.000	17-4 PH steel
CL 100 S 0090	55000	121254	90	3.54	130	5.12	80	3.15	100	3.94	700	10.000	17-4 PH steel

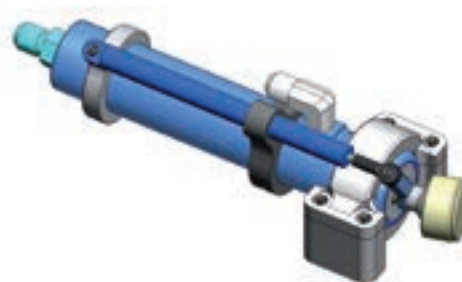
CUSTOM HYDRAULIC CYLINDERS

We develop brand new cylinders made of any kind of material and size, to suit individual needs.

Single or double acting telescopic hydraulic cylinders, oil dumpers, twin rod cylinders are part of Cariboni's know how.



*Titanium twin cylinder: n.2 double acting cylinder move together in a common tube.
Bore (each): 25mm Stroke: 190mm Working pressure: 700 bar
Extreme light weight and compact design.*



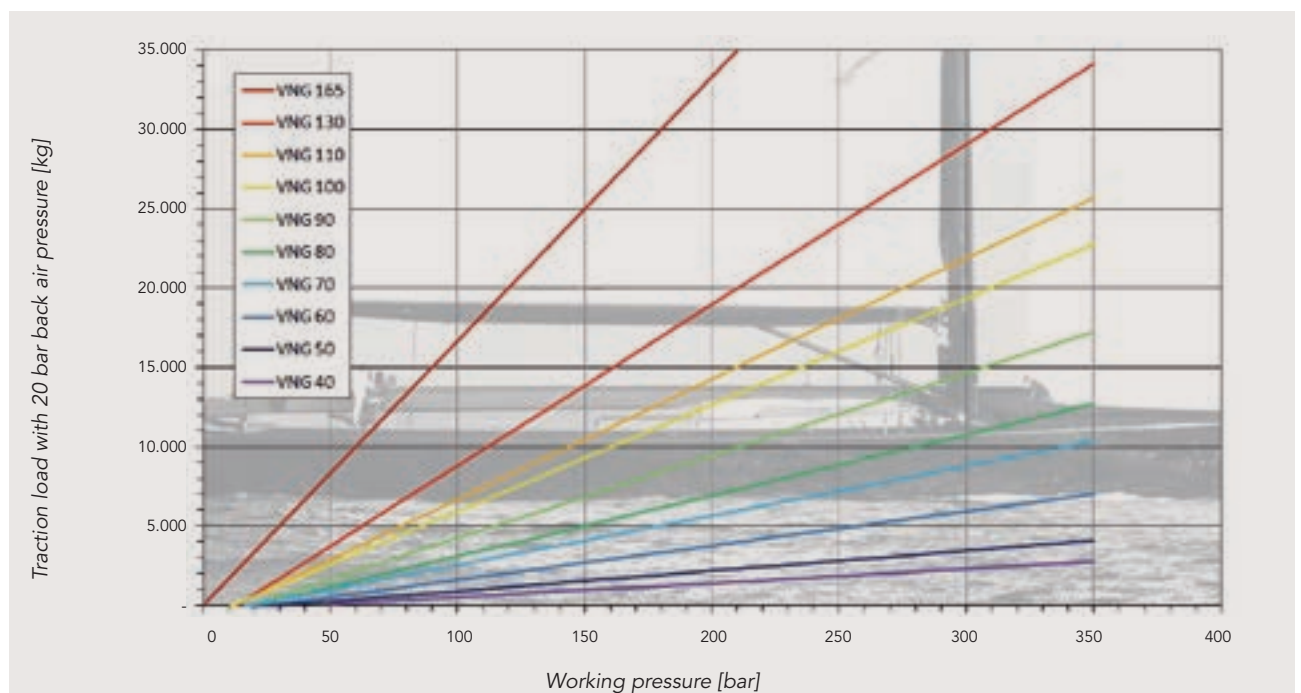
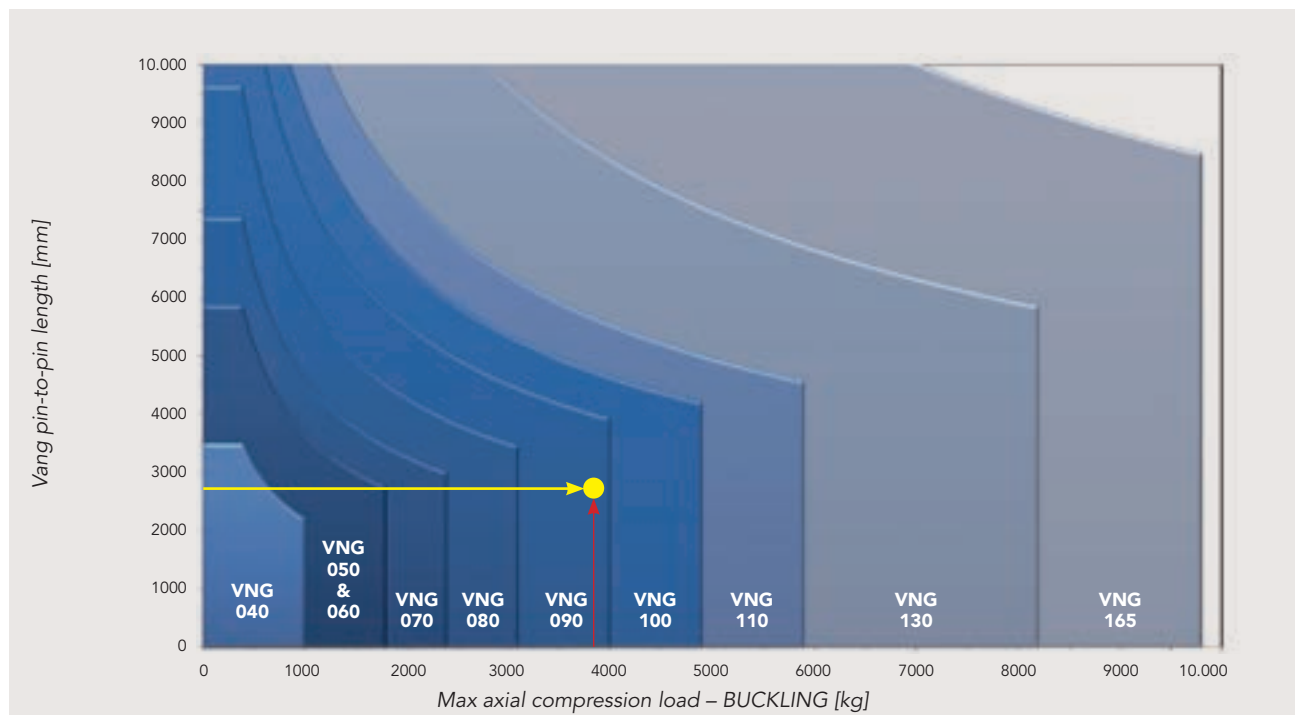
From left to right: stainless steel locking cylinder for a centerboard keel; titanium double acting cylinder with installed potentiometer sensor.

VANG

The best way to find your own vang is easy. Here below some steps.

- 1 Have a look to the rigging geometry and find out the vang pin-to-pin distance (PCLC) with boom in horizontal position
- 2 Make some calculation to identify the compression axial load on the vang: we suggest to mind the weight of the boom vang, mainsail, accessories (furling boom, other hydraulic cylinders) and add the weight of two people hanging up by the end of the boom...yes, it really could happens!
- 3 Check in the vang buckling diagram the size of your Cariboni vang
- 4 Check in the traction load diagram if the power of the vang is enough for your hydraulic system which is the working pressure of the ram

In the example shown in the diagram, with 3800 kg of maximum axial compression load and 2500 mm of PCLC, the right choice is a Cariboni VNG 90.

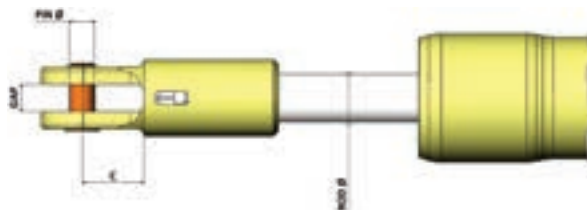




VANG

BOOM VANG MADE OF BLACK HARD COATED ALUMINIUM FOR SAILING YACHTS
POLISHED STAINLESS CYLINDER AVAILABLE FOR EACH SIZE

SIZE	MODEL	Max traction load ⁽¹⁾		Max return force ⁽²⁾		Stroke		Rod Ø	Gap	Pin	C	Oil vol.	Weight		
		kg	lb	kg	lb	mm	in	mm	mm	mm	mm	litres	Wkg ⁽³⁾	a	c
17	VNG 40	3127	6894	384	847	250	9,84	22	16,3	16,0	36,0	0,2	6	0,00204	1,7
20	VNG 50	4483	9884	600	1324	280	11,02	30	16,3	15,5	32,5	0,4	8	0,00303	2,9
24	VNG 60	7566	16679	865	1906	280	11,02	30	16,3	15,8	33,0	0,6	9	0,00303	3,7
30	VNG 70	10897	24023	1177	2595	300	11,81	31,8	19,5	19,0	47,0	0,9	14	0,00335	8,6
40	VNG 80	13450	29652	1537	3389	350	13,78	40	23,0	22,0	52,0	1,3	23	0,00511	11,6
60	VNG 90	18214	40154	1945	4289	360	14,17	40	25,0	25,0	52,0	1,8	31	0,00596	11,7
70	VNG 100	23538	51892	2402	5295	400	15,75	40	32,6	28,0	64,0	2,6	41	0,00681	22,9
90	VNG 110	26675	58808	2906	6407	430	16,93	50,8	32,6	31,8	66,2	3,2	54	0,00766	29,2
100	VNG 120	33345	73513	PUSH/PULL		450	17,72	50	36	35	64	5,1	59	0,01158	20
110	VNG 130	35517	78301	4059	8949	500	19,69	65	36,0	35,0	78,0	5,0	88	0,01290	51,9
195	VNG 150	42803	94365	5404	11914	500	19,69	85	45,0	45,0	95,0	6,0	114	0,01915	51,5
260	VNG 165	56043	123552	PUSH/PULL		526	20,71	85	50,8	50,8	112,5	11,3	134	0,02384	51,1
300	VNG 180	62768	138380	7782	17156	550	21,65	100	55,0	55,0	125,0	9,7	196	0,02785	100
400	VNG 200	84064	185330	9607	21180	550	21,65	100	55,0	55,0	135,0	13,0	280	0,03321	166
1	VNG 220	101717	224248	PUSH/PULL		600	23,62	110	60,0	60,0	148,0	22,8	363	0,03856	232



BOOM VANG FOR RACE SAILING YACHTS with CARBON FIBRE EXTENSION
HYDRAULIC RAM MADE ON TITANIUM and ALUMINIUM ALLOY

1	VNG 55 C	8971	19777	727	1602	280	11,02	28	16,3	16	35,5	0,49	4,80 kg w/o extension		
1	VNG 60 C	10808	23828	865	1906	280	11,02	30	16,3	16	36,0	0,59	5,75 kg w/o extension		
1	VNG 70 C	15516	34206	1177	2595	280	11,02	32	20,0	20	47,5	0,85	8,96 kg w/o extension		
1	VNG 80 C	19215	42362	1537	3389	400	15,75	40	25,4	25	60,0	1,51	20,00 kg w/o extension		
1	VNG 95 C	28021	61776	2168	4779	310	12,20	45	35,0	35	70,0	1,70	30,73 kg w/o extension		

Notes:

- (1) At 350 bar (5000 PSI) and no gas pressure. At 500 bar (7150 PSI) for carbon vang
 (2) At 30 bar (435 PSI) gas pressure. Return force can vary with gas pressure. The max value of return force depends on the PCLC
 (3) Weight for minimum length as example, please calculate the exact weight using the following formulas:
 $Wkg = (PCLCmm \times a) + c$ (PCLC is the vang length pin to pin cylinder closed in mm)
 $Wlb = Wkg \times 2,205$

BICYLINDERS

During **Mets trade fair 2007**, Cariboni presented its new astonishing product: two hydraulic cylinders to control the headstay and the Cunningham of TP52 yacht class, matched together in a new benchmark hydraulic cylinder. Our Bi-cylinder is the best choice for racing yachts which need to improve the control of their jibs.

During a sail, sometimes it is necessary to release the stay, so you have to remember first to release the Cunningham to avoid to overload it. With our Bi-cylinder you won't have this problem anymore: the Cunningham cylinder is fixed on the headstay cylinder tube and, when you release the headstay, the Cunningham follows it automatically.

Another winning idea of the Bi-cylinder is to match together tubes of the headstay and tubes of the Cunningham cylinder in a single lighter and smaller double tube. This piece is machined out from a single block of aluminium (or titanium) alloy in order to reduce as much as possible the weight of the cylinder.

The Cunningham ram has a gas room for a fast release even without traction load and the terminal rod has a standard female fork design.

The headstay tensioner tube terminal is ready to fit PBO stay; tube terminal is made of 17-4-PH to increase performances and avoid any problem of rust with carbon fibre headstay.

Cariboni's Bi-cylinder is fixed on board by the headstay terminal rod: it can be a female fork or a male terminal



Cannonball 72

with a spherical joint for a self-alignment system under load. Standard Bi-cylinders have hard coated aluminium alloy tube, rod and tube terminals, nitronic 50 rods and 17-4PH headstay rod terminal.

Titanium or 17-4PH models are available on request as custom arrangements for terminal rods, strokes and bores.

Our Bi-cylinders are installed on racing and fast cruising yachts in different sizes and with customised terminals.



Bicylinder

MODEL	Headstay Ram Bore		Headstay Ram Stroke		Cunningham Ram Bore		Cunningham Ram Stroke		Headstay Max Pull		Cunningham Max Pull		Dry Weight	
	mm	in	mm	in	mm	in	mm	in	kg	lb	kg	lb	kg	lb
BCL 045 022 250	45	1,77	250	9,84	22	0,87	208	8,19	6809	15011	1537	3389	3,7	8,16
BCL 050 022 255	50	1,97	255	10,04	22	0,87	210	8,27	8711	19203	1537	3389	4,5	9,92
BCL 055 022 300	55	2,17	300	11,81	22	0,87	250	9,84	9803	21613	1537	3389	5,0	11,02
BCL 060 030 300	60	2,36	250	9,84	30	1,18	250	9,84	10000	22046	1261	2780	8,5	18,74
BCL 065 025 350	65	2,56	350	13,78	25	0,98	280	11,02	14975	33015	1925	4245	7,0	15,43
BCL 070 030 350	70	2,76	350	13,78	30	1,18	300	11,81	16012	35300	2818	6213	8,5	18,74
BCL 075 030 350	75	2,95	350	13,78	30	1,18	300	11,81	18418	40604	2818	6213	9,4	20,72
BCL 085 040 350	85	3,35	350	13,78	40	1,57	300	11,81	25319	55819	5380	11861	12,4	27,34
BCL 085 050 350	85	3,35	350	13,78	50 ⁽¹⁾	1,97	165 ⁽¹⁾	6,50	25456	56121	3603 ⁽¹⁾	7943	18,9	41,67
BCL 090 045 250	90	3,54	250	9,84	45	1,77	230	9,06	25493	56202	6128	13510	14,8	32,63
BCL 090 055 600	90	3,54	600	26,62	55 ⁽²⁾	2,17	265 ⁽²⁾	10,43	19450 ⁽²⁾	42880	4662 ⁽²⁾	10278	26,0	57,32
BCL 095 055 190	95	3,74	190	7,48	55 ⁽³⁾	2,17	120 ⁽³⁾	4,72	14311 ⁽³⁾	31550	1865 ⁽³⁾	4112	15,1	33,29
BCL 100 055 250	100	3,94	250	9,84	55	2,17	300	11,81	35995	79355	6055	13344	26,2	57,74

(1) Pushing 2:1 cylinder

(2) Pushing 2:1 cylinder, bi-cylinder working pressure @ 350 bar

(3) Pushing 2:1 cylinder @ 150 bar, headstay @ 200 bar

BICYLINDERS



Bi-cylinder developed for class yacht races.



Momo '72
Judel Vrolijk design – Persico

DECK ORGANIZERS



Caritec's deck organizers are designed for race sailing yachts to lead halyards and to control sheets to the cockpit. These new organizers are made of 7075 ergal or 6082 aluminium alloy on main body; 17-4PH or titanium are used for the fixing screws.

The core of the system is the high strength peek rollers which guarantee the minimum friction on the sheet even under big loads.

Deck organizers are available with single or double pulley, depending on the needs and for the best layout of the cockpit. Custom models available on request.

Organizers



MODEL	Weight		Dimensions		Sheet diameter		Notes
	kg	lb	mm	in	mm	in	
	0,146	0,31	78x35 34 (h)	3,07x1,38 1,34 (h)	15	0,59	DOUBLE model Black hard coated aluminium base, peek roller, 17-4PH fixing screws Double pulley to drive the sheet left and right under load.
	0,70	0,15	68x30 26 (h)	2,67x1,18 1,02 (h)	13	0,51	SINGLE model Ergal 7075 hard coated base, peek roller with ball bearings, titanium fixing screws. Single pulley to drive the sheet or left or right under load.

INNERFORESTAY CYLINDERS

For fast cruiser sailing yachts, we offer a different solution based on standard single acting cylinder which is fully installed under the deck for a flush design.

The system is made up by three main parts:

- A single acting cylinder
- A manual turnbuckle
- An upper guide tube

The hydraulic ram, placed on the lower part of the system, is fixed by a chainplate inside the boat and pull down the stay by the hydraulic power; a gas spring help the system while easing.

The upper tube works as a guide for the piston where the lashing hook is fixed.

To easily match together those two parts, a turnbuckle is placed between the two rods to trim the distance between the hydraulic cylinder and the upper guide.

Both innerforestay models are available in many sizes and strokes to achieve designers requirements.

The lashing hook is supplied with the forestay cylinder and it is made of Dyneema®.



Innerforestay ram with lashing arrangement

MODEL	Max pull load	Stroke	L min (pin to deck)	Weight	Working pressure	Oil vol.	Weight		Working pressure		Oil vol.
	kg	lb	mm	in	mm	in	kg	lb	bar	psi	litres
PT 055 S 0250	7355	16216	250	9,8	1187	55,15	9,7	21,4	350	5000	0,5
PT 055 S 0400	7355	16216	400	15,7	1502	59,13	12,3	27,1	350	5000	0,8
PT 070 S 0260	11979	26409	260	10,2	1606	46,73	13,8	30,4	350	5000	0,9
PT 070 S 0270	11979	26409	270	10,6	1616	63,62	14,0	30,9	350	5000	0,9
PT 070 S 0300	11979	26409	300	11,8	1646	64,80	14,2	31,3	350	5000	1,0
PT 080 S 0300	15411	33975	300	11,8	2278	89,68	24	52,9	350	5000	1,3
PT 100 S 0500	25197	55548	500	19,7	2430	95,67	40,4	89,1	350	5000	3,5



Swan 82' design by Frers. With the under deck inner forestay hydraulic tensioners, a full flush and clean design of the bow comes true. On the right, our innerforestay cylinders.

MAGIC DOOR SYSTEM

Magic Door is a smart system for sailing yachts transom door.

By a simply and lightweight double acting cylinder, with a smart pulley system, this product let you to have an hydraulic transom door on your boat.

Magic Door consists in a double acting cylinder with an ingenious 2:1 tackle system. The terminal rod has 4 sheaves in order to manage at the same time all the 4 sheets which drive the cars on the tracks.

The Magic Door can be used also to easy control the bath platforms reducing the space required for the technical room.

Lightweight

Magic door consist of a single hydraulic cylinder. All the ram components are made of lightweight hard coated aluminium. Rod and tube terminals sheaves are made of high strength plastic and Polizene®. Fittings and screws are in stainless steel in order to avoid any problem of rust.

Compact and easy to place on board

The double acting hydraulic ram can be placed in different ways in the boat garage: horizontal, vertical, port or star-board side, under the cockpit or on the bulkhead.

Safety

The Magic Door system manage the movements of the door; it is possible to stop the system in every moment without any risk. Moreover, the sheets work as a bumper to protect the system from waves hits and overloads.



SOLARIS 48' "CRAZY TOO" (above): customer rods link the transom door to the cars on the track of Magic Door system



Wally 80 "Inti" (former "Indio"): Magic Door ram controls the bath platform

Magic Door cylinder is also available with a compact and lightweight installation kit

This CARITEC pack counts:

- the Magic Door double acting hydraulic cylinder
- tracks with sheaves and cars for double rods system (700mm stroke)
- Magic Door forehead pulley to drive the sheets to the tracks
- lightweight aluminium hydraulic power pack with integrated valves block and oil tank
- compact electric box with integrated power relay
- IP67 stainless steel push buttons to move up and down the transom door



MODEL	Bore		Stroke ⁽¹⁾		WP		Working load ⁽²⁾		Weight ⁽³⁾	
	mm	in	mm	in	bar	psi	kg	lbs	kg	lbs
CL 035 D 350	35	1.38	350	13.78	140	2000	1375	3032	2.5	5.51

(1) 350mm cylinder stroke. 700 mm cars stroke due to 2:1 tackle

(2) With 2:1 tackle the load on every car is split by half

(3) Double acting cylinder weight.

The overall weight of MagicDoor Kit is 9.8 kg (21.56 lb)

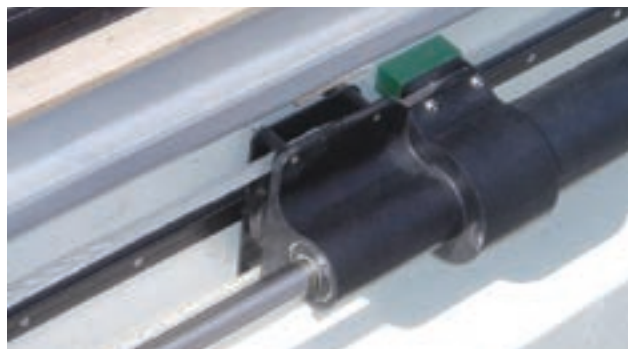


TRAVELER CYLINDERS

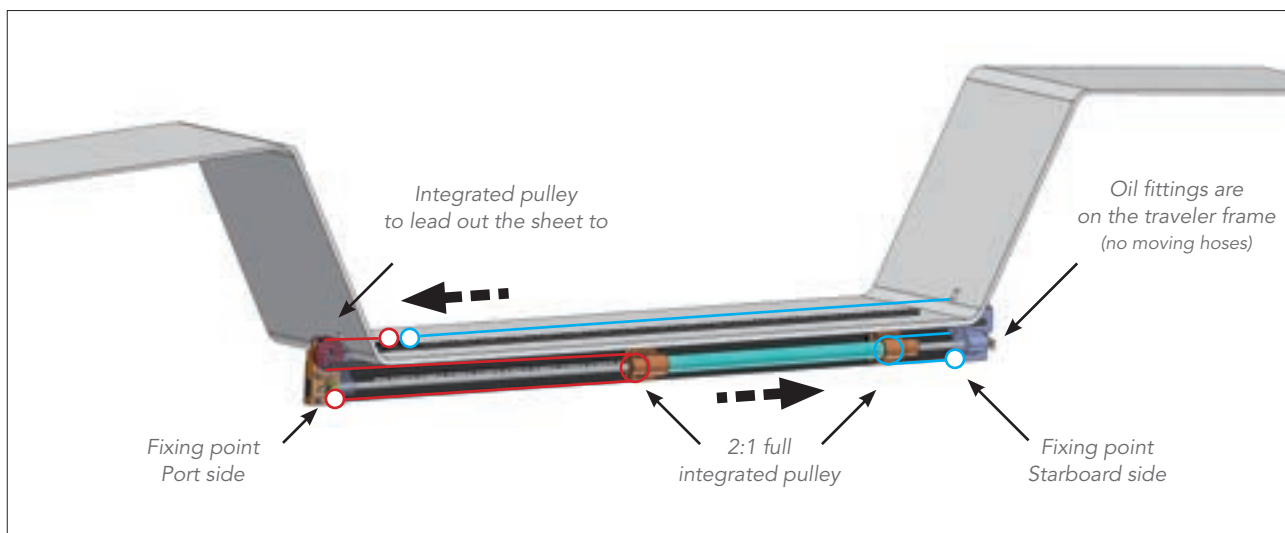
Designed for fast or race-cruiser sailing yachts, our hydraulic traveler let you to easily control the main or genoa cars.

The traveler has drilled rods: oil is pumped in the cylinder tube through the rod terminals which are fixed to the chassis of the system.

The same length of the main traveller track is guarantee by the 2:1 integrated purchase system. Tube terminals have integrated pulleys for the tackle.



Hydraulic traveler installed on board



The travelers are available with different types of chassis in order to follow the yacht design.

Black hard coated aluminium is used for tube and chassis; rods and pins are made of Nitronic 50 and low friction peek

is used for bearings. The frame is available in lightweight black hard coated aluminium or carbon fibre.

The framed can be removed, and it is possible to fix the traveler system straight to the bulkhead.

Custom models available on request.

MODEL	Working load ⁽¹⁾		Stroke		Bore Ø		Rod Ø		Overall length	
	kg	lb	mm	in	mm	in	mm	in	mm	in
CL 040 DS 0900	1681	3707	900	35,4	40	1,57	20	0,78	2050	80,7
CL 045 DS 0330	2277	5019	330	13,0	45	1,77	20	0,78	980	38,6
CL 050 DS 0900	2942	6486	900	35,4	50	1,97	20	0,78	2102	82,8
CL 050 DS 1000	2942	6476	1000	39,4	50	1,97	20	0,78	2302	90,6
CL 050 DS 1100	2942	6476	1100	43,3	50	1,97	20	0,78	2502	98,5
CL 055 DS 2150	3363	7414	2150	84,6	55	2,17	25	0,98	4745	186,8
CL 055 DS 2000 Titanium ⁽²⁾	3459	7625	2000	78,7	55	2,17	25	0,98	4812	189
CL 065 DS 2430	5044	11120	2430	95,7	65	2,56	25	0,98	5211	205
CL 070 DS 0749	5990	13205	749	29,5	70	2,76	25	0,98	2490	98,0
CL 070 DS 1000	5990	13205	1000	39,4	70	2,76	25	0,98	2992	118
CL 100 DS 5245	12750	28108	5245	206	100	3,94	30	1,18	6103	240

(1) Sheet working load at 350 bar (5000 PSI) (2) Working pressure 500bar

TRAVELER CYLINDERS



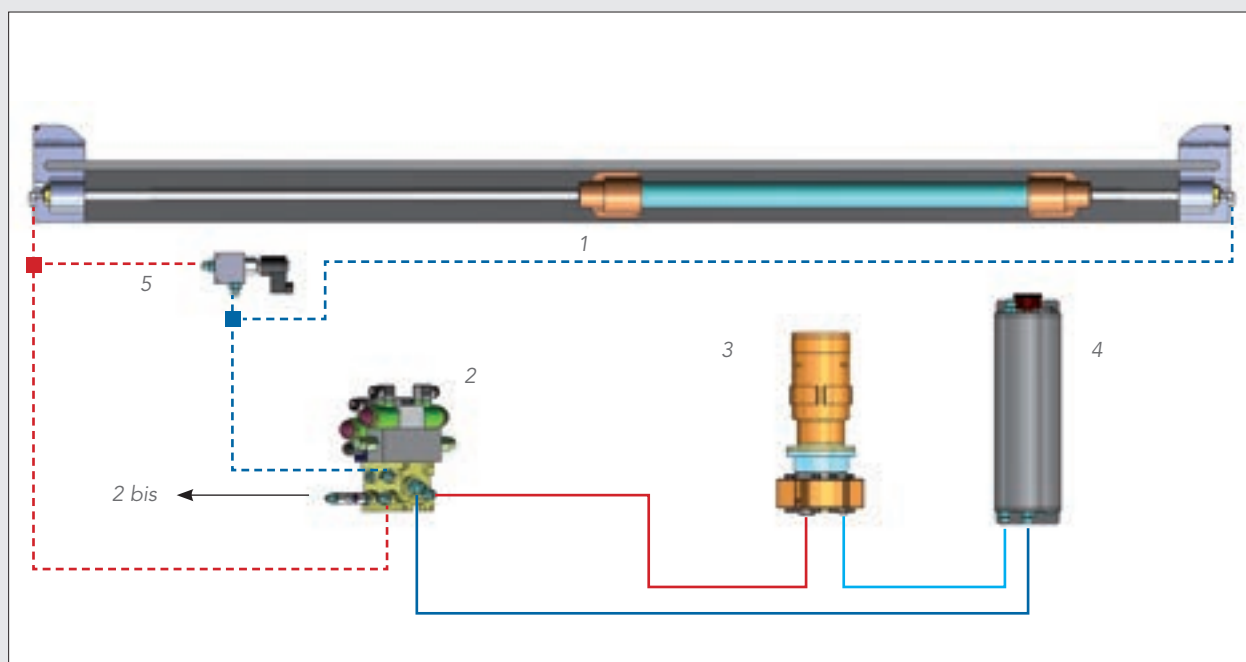
This double acting cylinder, closed to traveler arrangements is installed on a 90' race-cruiser yacht. It controls the jib car by two sheets and it is squeezed under the car track in a very small room.



Hydraulic traveler installed on a 86' fast cruise yacht. The rod terminals are fixed on the boat and the tube slides on a car driven by a track. No moving hoses, easy installation and few space requirement.

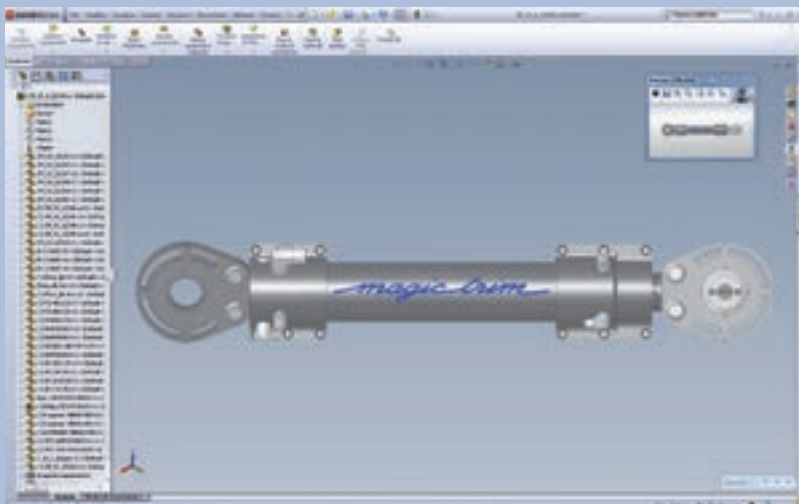
Our package can be composed by:

- traveler double acting cylinder (with custom bore, stroke and arrangement) **(1)**
- valve block to drive the traveller system made on lightweight aluminium manifold and stainless steel fittings **(2)**
- electric back-up for manual panel up to 500bar **(2bis)**
- electric powerpack with high pressure piston pump and long life forced air cooled electric engine **(3)**
- pressurized aluminium oil tank **(4)**
- by-passed valve to bump the traveler when jibing/tacking or emergency **(5)**
- electric control box with stainless steel push buttons and proximity switches



Lighter and more compact systems, with a single acting cylinder, are available to control main car up from downwind up to the boat centre or to control jib in/out car.

magic trim



Magic trim was created in 1998. It has been the first hydraulic double acting cylinder with integrated 4:1 tackle designed to work with two different speeds.

It is the result of a pure Giovanni Cariboni's innovative idea; the product is **patented** from Cariboni.

Nowadays, the Magic Trim appears on more than a hundred sailing boats all over the world, pushed by the need to trim and release in a very short time the sheets under big loads. Magic Trim spreads from a length of 30' to an unspecified length: the biggest size produced today is the 210' of the Magic Titanium.

The idea

This is a simple and clever idea: a 4:1 tackle made by a double acting hydraulic cylinder with two sheaves mounted at both ends. When the actuator is extended, the sheet passing through the sheaves is trimmed by a length equal to four times its extension; on the contrary, when the actuator is shortened the sheet is released. With this revolutionary system, to trim the sails you can eliminate the need of winches on deck; the result is a clear deck with a powerful and fine system to control the sails.

The main features

Magic Trim has a 4:1 tackle but the load transmitted to the fixing points of the ram is identical to the sheet working load thanks to the system design, which permits you to have a lighter boat structure.

Considering the same sheet load, Magic Trim is faster, lighter and more reliable than the traditional maneuvering systems; therefore it is successfully utilized by cruising and regatta sailing boats. With Cariboni's hydraulic system, it is possible to have fast and slow regulations even with heavy loads just pushing a button!

For fine tuning, Magic Trim is available with full integrated linear sensors and proportional control of speed.

Magic Trim works with a designed working load and when the regulation is done, it can go up to 1.6 times the maximum designed working load; when higher values are applied, the sheet is automatically released, in order to preserve the boat equipment.

The main applications

Besides having a number of special applications, Magic Trim is normally used on sailing boats for the main sheet regulations, main sail traveler or jib sheet regulations, and in every other occasion it is necessary to pull long sheets in a limited space (for lifting keel cylinder too).



A flash and clear deck on "Sizzler" the astonishing 60' day sailer designed by Tony Castro. Magic Trim are used for jib and mainsheet controls tacking off the winches and any jam with the sheet!



A Magic story...

1998 - Magic Trim

The original one, patented since 1998.

Cariboni improves hydraulic rams for sail trimming by developing the Magic Trim, faster than the conventional rams and with the peculiarity of having two speeds: this allows to have a faster and smoother control of the sails with the best reliability.

2000 - Magic Simple

Designed for 2000 AC yachts, Magic Simple is the powerful solution to trim the highest load you can find on a race sailing yacht. Magic Trim Simple has a 2:1 tackle powered by a push cylinder in a compact and lightweight solution.

2001 - Magic Testa

It is a special version of Magic Trim, engineered for unique applications: those units have been installed on the 60' trimarans Tim an Bonduelle in which the mainsheet and the canting mast are hydraulically controlled by Magic Testa cylinder.

2002 - Magic Trim Double

Magic Trim Double is the straight development of Magic Trim and Magic Simple concept: a fast Magic Trim and the powerful Magic Simple all in one. So you can have a smart system which copy the load on sheet and let you save space, weight and power.

2004 - Magic Air

This special kind of Magic Trim has the same 4:1 tackle powered by the hydraulic push cylinder, but the ease of the sheet is driven by the air spring on the head ram. Thanks to Magic Air we're able to offer the same features of the standard Magic Trim with a lighter and more compact system.

2005 - Magic Trim + Magic Double arrangement

A Magic Trim ram to control faster the sheet and a Magic Double for a quick trimming. This kind of arrangement has often custom sheaves solution full integrated on the two Magic, according to the yacht design.

2007 - Smart Magic Trim

This is the Magic Trim for high-tech sailing yachts! What you can see from outside is just the slim shape of Magic Trim; but inside there are all the technologies of a magnetic field linear sensor ready to control time after time the cylinder status. This is the standard solution for a full automatic sail trimming system.



1998 - Magic Trim

2008 - Smart Magic Double

Smart Magic Double matches together everything that you can ask from a hydraulic trim system; sharp control of the sheet with two integrated linear sensors; speed and power thanks to the Magic Double concept; safety and quickly control of the rams with the incorporated max pressure and directional control valves. The ultimate solution for the next century sailing yachts.



Wally 148' Saudade

2009 - Magic Boom

Take a Cariboni's Magic Trim, squeeze it on a modern sailing yacht boom and what you have is a Magic Boom! This kind of Magic Trim has special features in order to easily place the cylinder inside the sailing yacht booms.



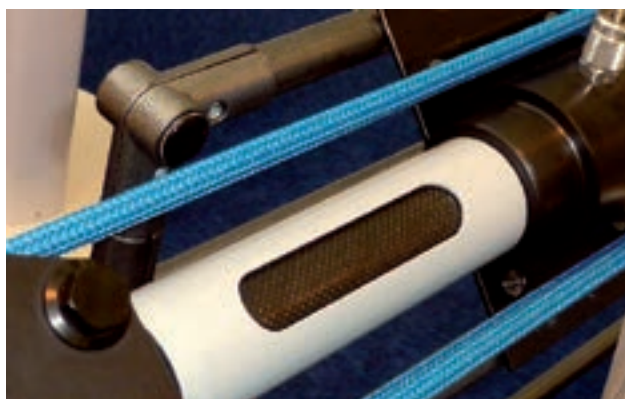
A magic story...

2010 – Carbon Magic

Magic Trim with special carbon fibre rod is available for racing yachts to cut down weight and boost up the power of our hydraulic system. Carbon Magic works at higher pressure than standard rams and it weight almost half then the other standard systems with the same working load. Less weight, more power, more efficiency.

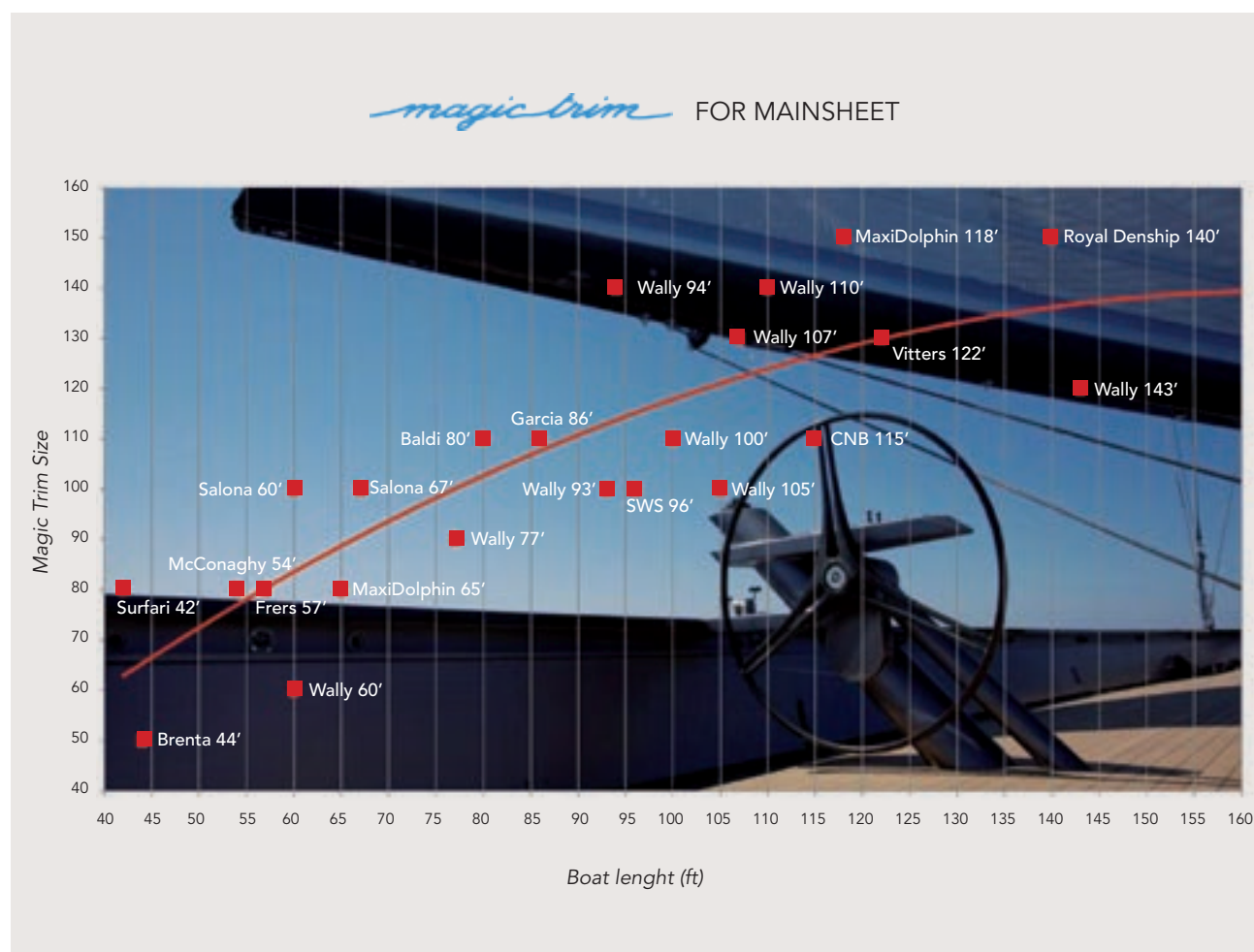
Special Magic

Every Magic Trim is special but, how do you call a Magic Trim with titanium rod? Or another one with 17-4 PH rod, titanium tube and high strength aluminum alloy parts? Theese Magic trim cylinders are just an hallmark of Cariboni's attitude for their customs needs. More power? Less weight? Something special? Just ask!



2010 – Carbon Magic

...which goes on!



HOW TO CHOOSE YOUR MAGIC TRIM FOR MAINSHEET

The buckling length is one of the Magic Trim size selection. Here is a simple procedure to calculate the effective mainsheet stroke and therefore the minimum Magic Trim required.

You need to know only two things:

- the effective main sheet stroke
- the maximum load on mainsheet

Follow this easy example to calculate your mainsheet stroke:

d = distance between sheet and mast

b = distance between boom and deck

α = back spread angle

β = effective maximum mainsail angle
(ex: $\alpha - 10^\circ$ to avoid any contact between mainsail and cross-trees)

You have to calculate first of all the "a" length:

$$a = 2 \times d \times \sin\left(\frac{\beta}{2}\right)$$

the "c" dimension:

$$c = \sqrt{a^2 + b^2}$$

And the effective sheet stroke

$$s = c - b$$

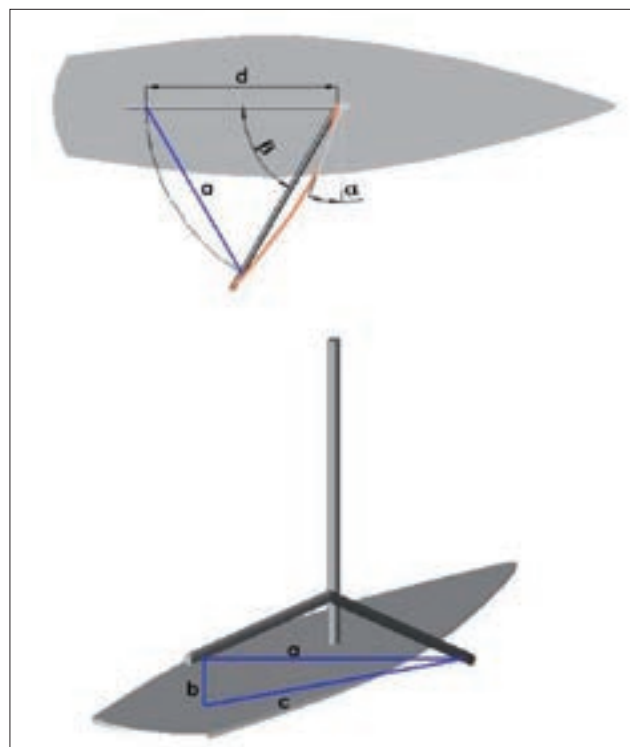
Suppose to have **d**=10m, **b**=2.5m and $\beta = 60^\circ$ you calculate:

$$a = d = 10\text{m}$$

$$c = 10.3\text{m}$$

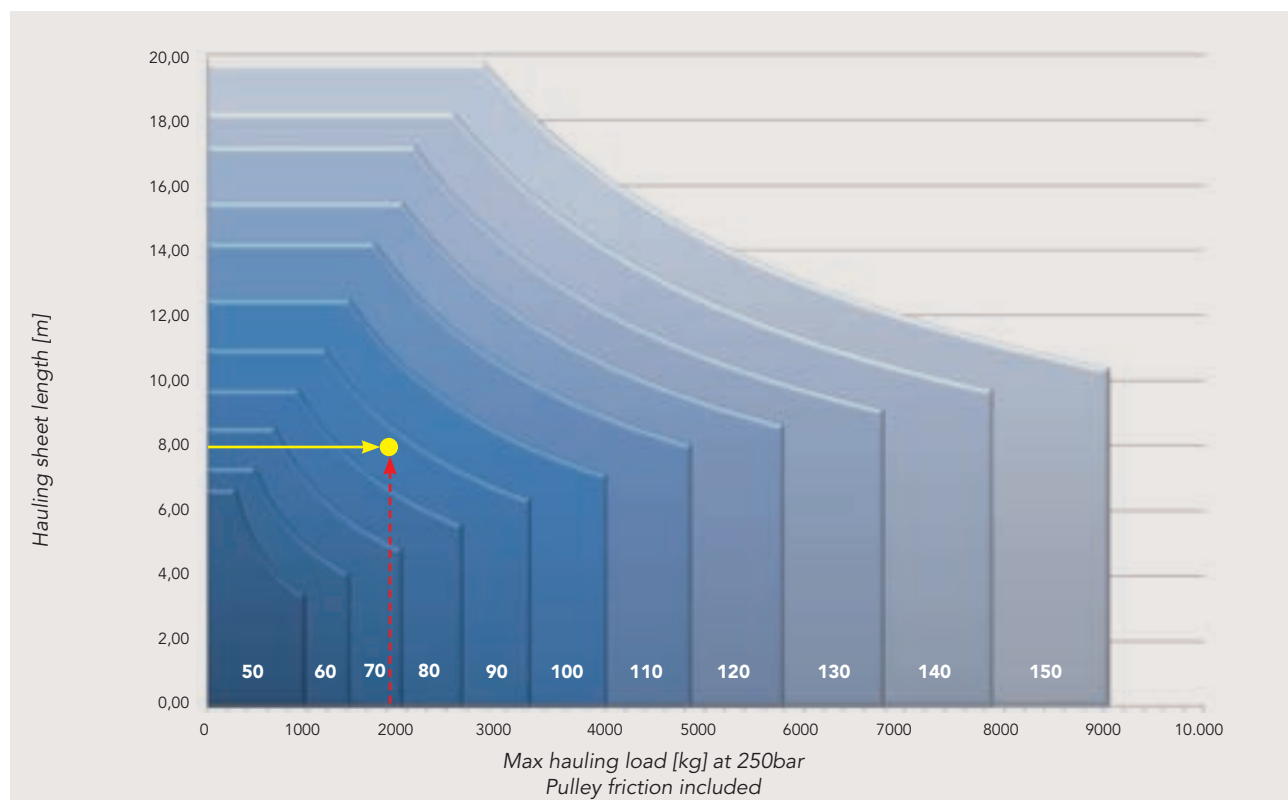
$$s = 7.8\text{ m}$$

Now put this sheet length and the maximum load on sheet into this diagram and found out which is the size your Magic Trim for mainsheet.



Mainsheet lenght

Example: effective mainsheet stroke $s = 7.8$ meters, load on sheet of 1800kg -> Your Magic Trim is: **MT_90_1850** (90mm of bore, $7.8/4=1950\text{mm}$ of stroke)





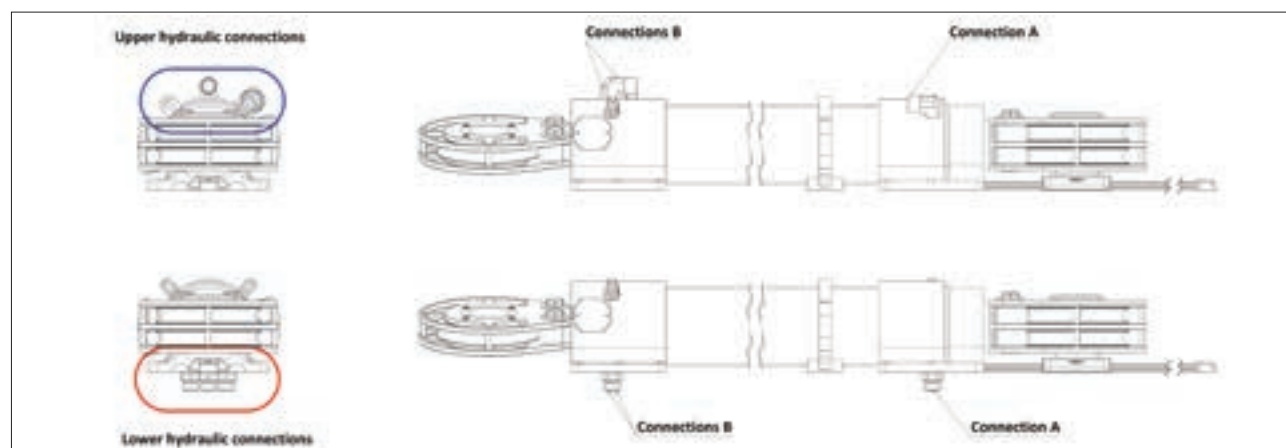
TECHNICAL SPECIFICATIONS

You can calculate the overall length of your Magic Trim, the dryweight and the working pressure of the cylinder filling the form below (in blue an example).

MODEL	Hauling Sheet Length	Stroke	Magic Max Length		Magic Weight			Working Pressure		
	S (mm)	Y	Const. Length	L_{MAX}	Const. Weight	Weight Coefficient	Weight	Hauling Load	Pressure Coefficient	Pressure
		$Y = S/4$ (mm)	T	$L_{MAX} = S/2 + T$ (mm)	Q	U	$W = Q + U * S/4$ (kg)	F (kg)	C	$P = F * C$ (bar)
MAGIC 50			529		6,7	0,0072			0,1996	
MAGIC 60			532		8,2	0,0080			0,1388	
MAGIC 70			595		10,2	0,0115			0,1020	
MAGIC 80	7800 mm	1950	644	4554 mm	16,0	0,0119	39,25 kg	1800	0,0781	141 bar
MAGIC 90			766		24,6	0,0205			0,0617	
MAGIC 100			797		28,7	0,0235			0,0500	
MAGIC 110			800		30,7	0,0286			0,0413	
MAGIC 120			801		35,2	0,0331			0,0347	
MAGIC 130			884		46,5	0,0407			0,0296	
MAGIC 140			976		53,5	0,0441			0,0255	
MAGIC 150			1014		66,6	0,0492			0,0222	

On our website there is also a very simple program to choose your model and to have these basic data about you Magic Trim.

MagicTrim has two hydraulic connections ("A" and "B"): for better installation layout you can choose the place of your hydraulic connections in the upper side of the cylinder or in the lower side.



The Magic Trim is available also with double fixed pulley. You need the double pulley option when you have a furling

system and you need to change the length of the sheet to permit the sail to be furled.

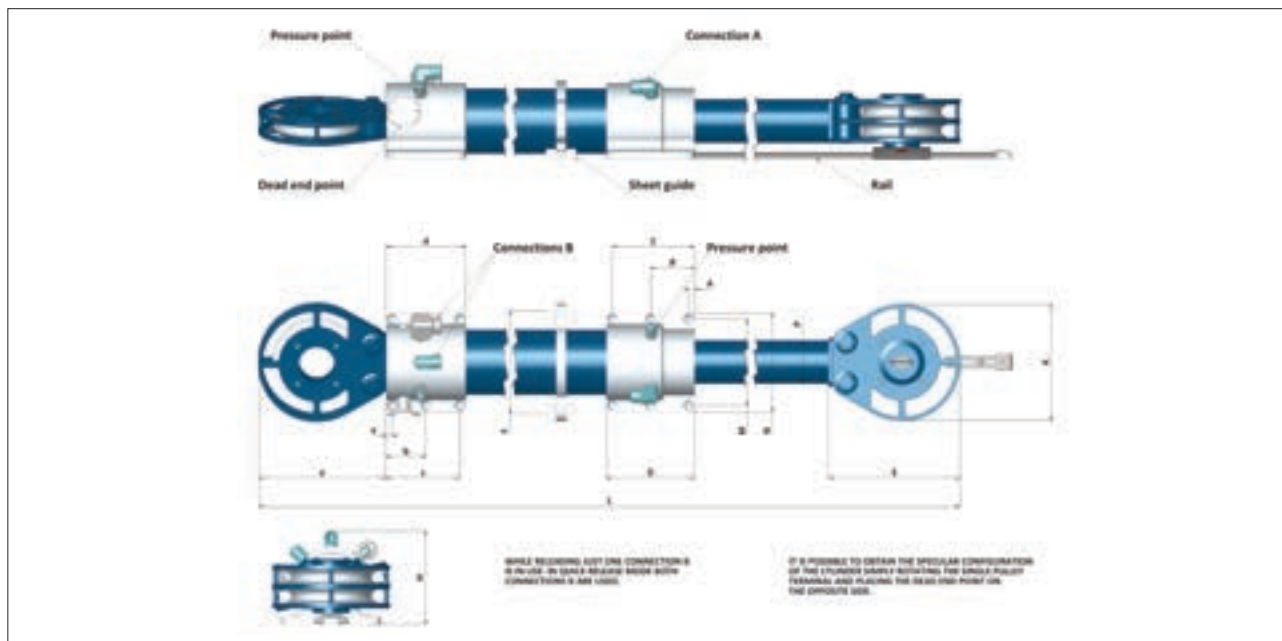


Single fixed pulley



Double fixed pulley

TECHNICAL SPECIFICATIONS



MODEL	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)
MAGIC 50	10,00	69,50	129,00	139,00	168,50	10,00	105,00	-	115,00	163,50
MAGIC 60	10,00	106,00	-	116,00	165,00	10,00	106,00	-	116,00	162,00
MAGIC 70	10,00	75,00	140,00	150,00	184,75	10,00	60,00	110,00	120,00	176,94
MAGIC 80	10,00	80,00	-	90,00	203,50	10,00	60,00	110,00	120,00	194,50
MAGIC 90	12,00	55,50	99,00	111,00	257,50	12,00	74,00	136,00	148,00	253,50
MAGIC 100	12,00	87,25	162,50	174,50	260,50	12,00	79,00	146,00	158,00	252,50
MAGIC 110	12,00	59,55	107,10	119,10	266,58	12,00	85,00	158,00	170,00	258,58
MAGIC 120	15,00	87,50	160,00	175,00	285,00	15,00	83,25	151,50	166,50	278,00
MAGIC 130	19,50	97,50	175,50	193,50	298,25	15,00	89,00	163,00	178,00	291,25
MAGIC 140	15,00	102,75	190,50	205,50	327,00	15,00	91,25	167,50	182,50	320,00

MODEL	F (mm)	H (mm)	K (mm)	M (mm)	N (mm)	P (mm)	Bolts Ø (mm)	Max sheet Ø (mm)	CONN. A	CONN. B
MAGIC 50	135,00	110,00	149,00	105,00	125,00	42	8	14	9/16" UNF - JIC 37°	9/16" UNF - JIC 37°
MAGIC 60	151,00	114,00	147,00	110,00	130,00	50	8	14	9/16" UNF - JIC 37°	9/16" UNF - JIC 37°
MAGIC 70	164,50	123,20	155,00	130,00	150,00	60	8	16	3/4" UNF - JIC 37°	3/4" UNF - JIC 37°
MAGIC 80	174,50	131,75	180,00	140,00	160,00	70	8	18	3/4" UNF - JIC 37°	3/4" UNF - JIC 37°
MAGIC 90	225,00	157,50	235,00	165,00	188,00	75	10	20	3/4" UNF - JIC 37°	3/4" UNF - JIC 37°
MAGIC 100	233,00	173,00	231,00	171,00	195,00	85	10	20	3/4" BSP	3/4" BSP
MAGIC 110	231,00	181,57	239,00	182,00	206,00	95	10	22	3/4" BSP	3/4" BSP
MAGIC 120	248,00	193,45	262,00	205,00	235,00	100	12	22	3/4" BSP	3/4" BSP
MAGIC 130	280,00	208,18	274,00	218,00	248,00	110	12	24	3/4" BSP	3/4" BSP
MAGIC 140	290,00	215,00	290,00	220,00	250,00	120	12	24	3/4" BSP	3/4" BSP



SPRING PULLEY

Our spring pulley permits to avoid any jam line on the under deck hydraulic rams, while easing without load on the sheet.

This simple and clever idea stops the system when the load on the sheet becomes too low. This action protect the system from any damage.

No hydraulic power requested.



SPRING PULLEY

Dimensions: 375 x 65 x 65 mm



Weight: 1.074 kg

MODEL	Overall dimensions		Max sheet Ø		Weight	
	mm	in	mm	in	kg	lb
SP 015	351 x 57 x 60 (h)	13,8 x 2,2 x 2,4 (h)	15	0,6	1,0	2,2
SP 024	310 x 57 x 73 (h)	12,2 x 2,2 x 2,9 (h)	24	0,9	1,2	2,6

MAGIC PULLER

Magic Puller is composed by an high efficiency hydraulic engine matched together with a pulley or with an high strenght rubber chain. This very compact system is driven by a proper hydraulic manifold which controls the speed of the system in order to keep load on the sheet in every circumstance.

Both model of Magic Puller are made of lightweight black hard coated aluminium alloy with low friction ball bearing and stainless steel oil fittings and screws. Different sizes and custom solutions are available on request.

MODEL	Overall dimensions		Sheet Ø (1)		Weight		Working pressure		Note
	mm	in	mm	in	kg	lb	bar	psi	
	337x180 139(h)	13,3x7,1 5,5(h)	20	0,78	8,5	18,7	140	2000	For on line arrangement. Under the deck mounting position.
	302x283 164(h)	11,9x11,1 6,45(h)	20	0,78	7,65	16,8	250	3570	For step block arrangement. Deck mounting position.

(1) Custom models available for bigger sheet diameter



Single fixed pulley

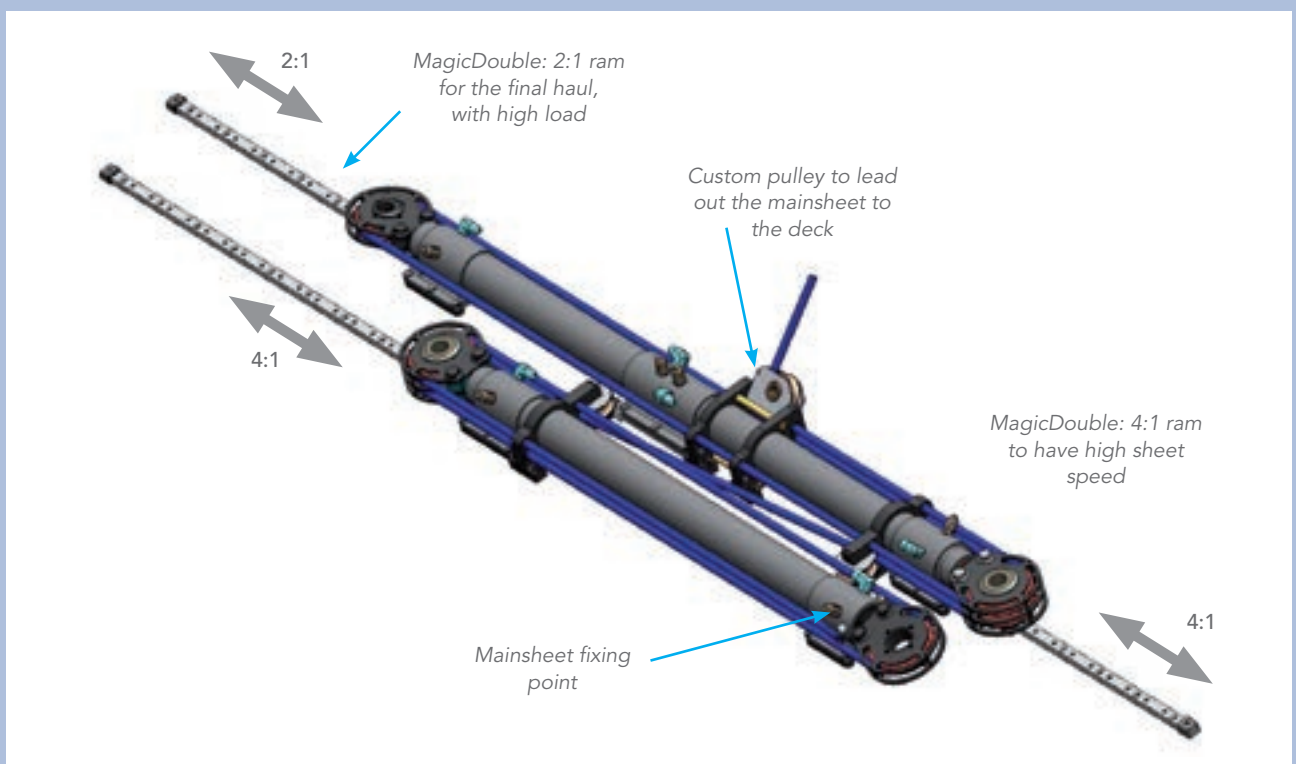


Double fixed pulley

magic double

It is composed by two integrated rams: one works as a 4:1 tackle for the starting quick hauling; the other works as a 2:1 tackle for the final powerful setting due to the exponential trend of the load.

Compared to standard cylinders, *Magic Double* has smaller dimensions, considering the same load. Lower size, less oil volume, saving of weight mean an increasing of performance and speed.



The mainsheet Magic Trim + Magic Double system developed for a Swan '60. Trim sequence: both cylinders closed, Magic Trim start to exit, then starts the 4:1 side of Magic Double tacking the mainsheet speed. When the 4:1 side of Magic Double is fully extended and the load of sheet increases, the 2:1 Magic Double ram completes the hauling of the sheet. Vice versa for easing sequence.

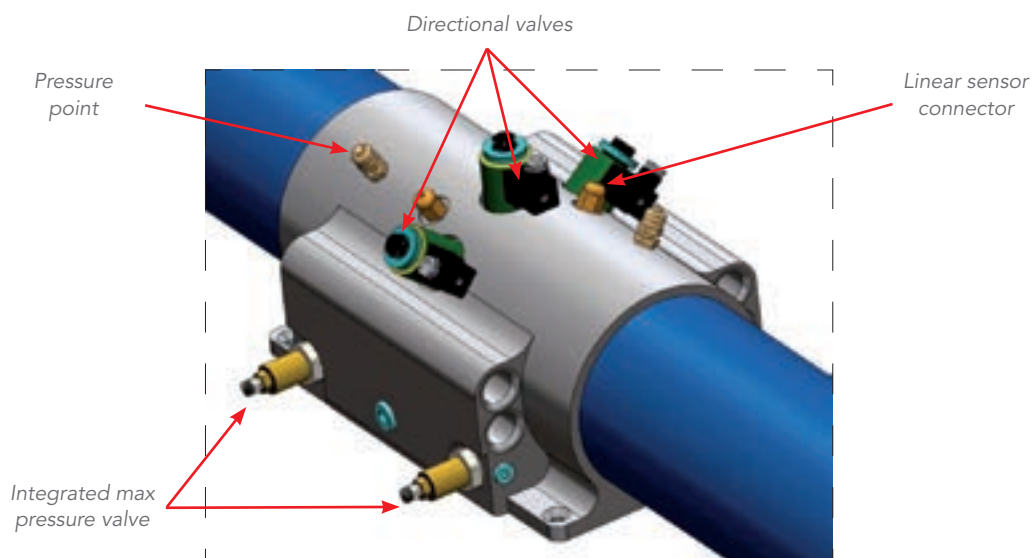


SMART MAGIC DOUBLE

Smart Magic Double is a Magic Double with integrated valves in the central part of the cylinder. Directional valves and release valves are part of the ram so as to guarantee the maximum system reliability and safety.

Smart Magic Double is often equipped with integrated linear sensor to perfectly control the sheet.

Smart MagicDouble
Bore: 140mm
Stroke: 1400mm (4:1), 1000mm (2:1)
Hauling sheet length: 7.6 meter
Hauling load on sheet: up to 9 tons



Wally 130' deck: Smart MagicTrim and MagicDouble are used for mainsheet and jib sheet. Thanks to these automatic systems, the deck is flush and free from winches and their sheets.



Magic Trim and Smart Magic Double arrangements for Wally 130' shown at 2008 METS trade.

SMART CARBON / TITANIUM MAGIC DOUBLE

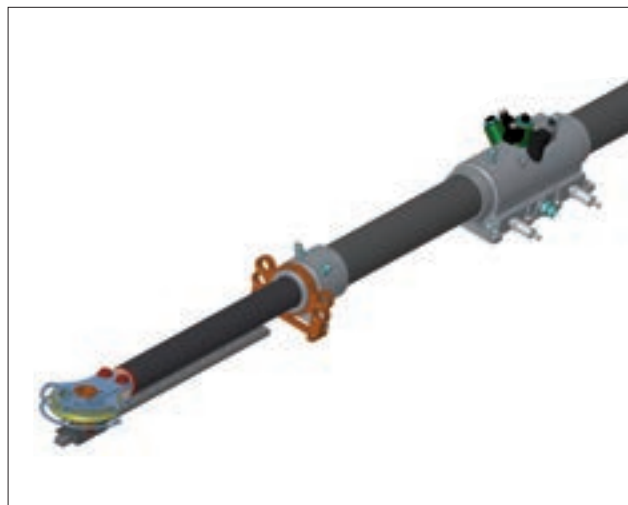
Here's the carbon fibre rod and titanium tube version of the Smart Magic Double.

Thanks to the unique characteristics of the carbon fibre, the new Magic Trim handles higher loads and longer hauling lengths than the conventional Double Magic Trim.

The titanium tubes allow a working pressures up to 600 bar with lower weight and dimensions compared to a standard aluminium ram.

We developed the sizes 90, 100 and 110 and the first three units are installed on Wally Cento "Hamilton" to control the runners and the mainsheet. Wally Cento "Magic Carpet 3" is equipped with these rams.

These carbon titanium Magic Double are all equipped with directional, max pressure valves and integrated linear sensors on the central hub to have more control and maximum reliability.



Smart Carbon Magic Double

Model	Max hauling load		Max hauling length		Working pressure 2:1 ram		Stroke				Bore		Dry weight	
	kg	lb	mm	in	bar	PSI	2:1 ram		4:1 ram		mm	in	kg	lb
MD 090 0600-1800	6000	13.200	8400	329	250	3625	600	23,6	1800	70,9	90	3,54	79	174
MD 100 0800-2150	7700	16.940	10.200	400	250	3625	800	31,5	2150	84,6	100	39,3	116	255
MD 110 1000-2300	9500	20.900	11.200	439	250	3625	1000	39,4	2300	90,5	110	4,3	182	401



Wally 100 Magic Carpet 3 and
Wally 107 Open Season



SIMPLE MAGIC TRIM

Simple Magic Trim comes from the idea of the Magic Trim, applied to very compact dimension and weight.

This is a 2:1 tackle made by a single acting cylinder that works in compression. When the ram is extended, the sheet passing through the sheave is trimmed by a length equal to two times its extension. The ram is closed by the sheet load when the oil is released.

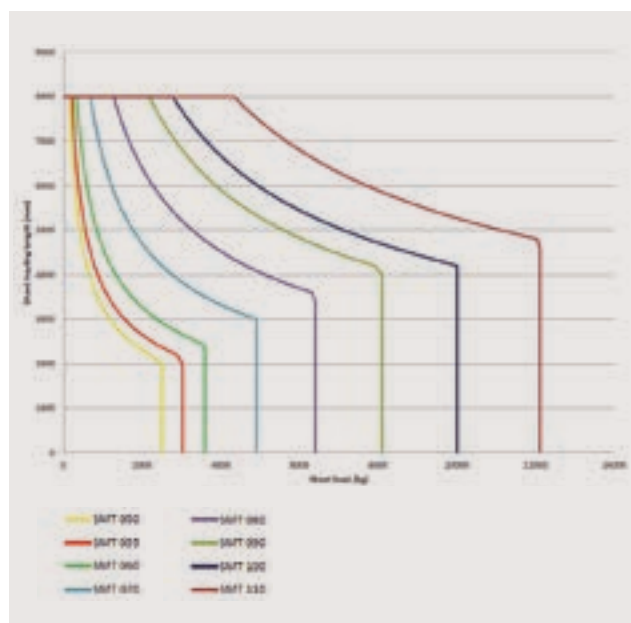
It is possible to control a single or a double sheet choosing the respective sheave. Even though the system is made by a tackle, the load transmitted to the fixing point is identical to the sheet working load.

The Simple Magic Trim is available in three high tech Titanium models and three 7075 Aluminium (Ergal) models with different load and stroke.



TITANIUM SMT 30 Ti FOR 2000 AMERICA'S CUP

MODEL	Max hauling load		Max oil pressure		Hauling breaking load		Oil fittings	
	kg	lb	bar	psi	kg	lb	Connection A	Connection B
SMT 050	2502	5516	250	3625	5000	11023	9/16 UNF – JIC 37°	9/16 UNF – JIC 37°
SMT 055	3027	6673	250	3625	6000	13228	9/16 UNF – JIC 37°	9/16 UNF – JIC 37°
SMT 060	3603	7943	250	3625	7000	15432	9/16 UNF – JIC 37°	3/4 UNF – JIC 37°
SMT 070	4904	10811	250	3625	10000	22046	9/16 UNF – JIC 37°	3/4 UNF – JIC 37°
SMT 080	6405	14121	250	3625	12000	26455	9/16 UNF – JIC 37°	3/4 UNF – JIC 37°
SMT 090	8106	17871	250	3625	16000	35274	3/4 UNF – JIC 37°	3/4 BSP
SMT 100	10008	22064	250	3625	20000	44092	3/4 UNF – JIC 37°	3/4 BSP
SMT 110	12109	26696	250	3625	24000	52911	3/4 UNF – JIC 37°	3/4 BSP



Allegra by Nigel Irens design - Green Marine

SIMPLE MAGIC TRIM



MODEL	Bore mm	A mm	B mm	C mm	D mm	E mm
SMT 050	50	115	139	125	168,5	149
SMT 055	55	95	104	120	136,5	144
SMT 060	60	116	116	130	165	147
SMT 070	70	120	150	150	184,7	155
SMT 080	80	120	90	160	203,5	180
SMT 090	90	148	111	188	257,5	235
SMT 100	100	158	174,5	195	260,5	231
SMT 110	110	170	119,1	206	255,6	239

MAGIC TESTA

Magic Testa concept is a special version of Magic Trim, engineered for unique applications: the boat which installed Magic Testa on board, like the 60' trimarans Tim and Bonduelle, used it to hydraulically control the mainsheet and the canting mast.



Magic 95 Testa Canting Mast



The mainsheet is controlled by a smaller unit installed inside the boom.

The movement of the mast (both 20° left-right and bow-stern) is controlled by two Magic Testa horizontally installed in the side hulls, which act on the shroud through a pivoting pulley.



EASY SAILING

Easy Sailing means play with your sailing yacht by yourself: even with the modern mega-yachts a sailor man can tack or jib by himself just pushing a button and feel free to sail alone!

Our Easy Sailing System increases boat security reducing to the minimum the human efforts and errors on winches.

With automatic mainsheet and jib control system, sail is more amusing and every tacking or jibing will be a pleasure!

Easy Sailing System is a wise mix of all the best technologies available in marine environment:

- Lightweight hydraulic cylinder for the control of the sails (mainsheet, jib sheet, main car and jib cars)
- Furlers for main, staysail, jib and code zero sails
- Aluminium hydraulic manifold blocks to drive all the hydraulic devices
- High efficiency electric powerpacks to supply the hydraulic system
- Marine PLC electronic control to manage the power with accuracy for a quick, smooth and safe movement of all the automations
- On/off standard and proportional control button panels get easy the helm man's life giving the full control of the yacht

We can supply a full integrated easy sailing system for small and big yachts.

In the 33' Wallynano, Easy Sailing System is made by:

- Mainsheet MagicTrim ram with manual backup system
- Jib sheet single acting ram with 2:1 tackle
- Boom vang
- Backstay ram with 2:1 tackle
- Hydraulic system with aluminium manifold and 12V 2500Watt powerpack
- Electronic control with PLC system

The system has a 250bar working pressure and all the functions have a speed control. The mainsheet ram has also fast and trim speed both for hauling and for easing.



Wally 143 "Esense"; mainsheet and jib sheet are full controlled by MagicTrim and MagicDouble cylinders.

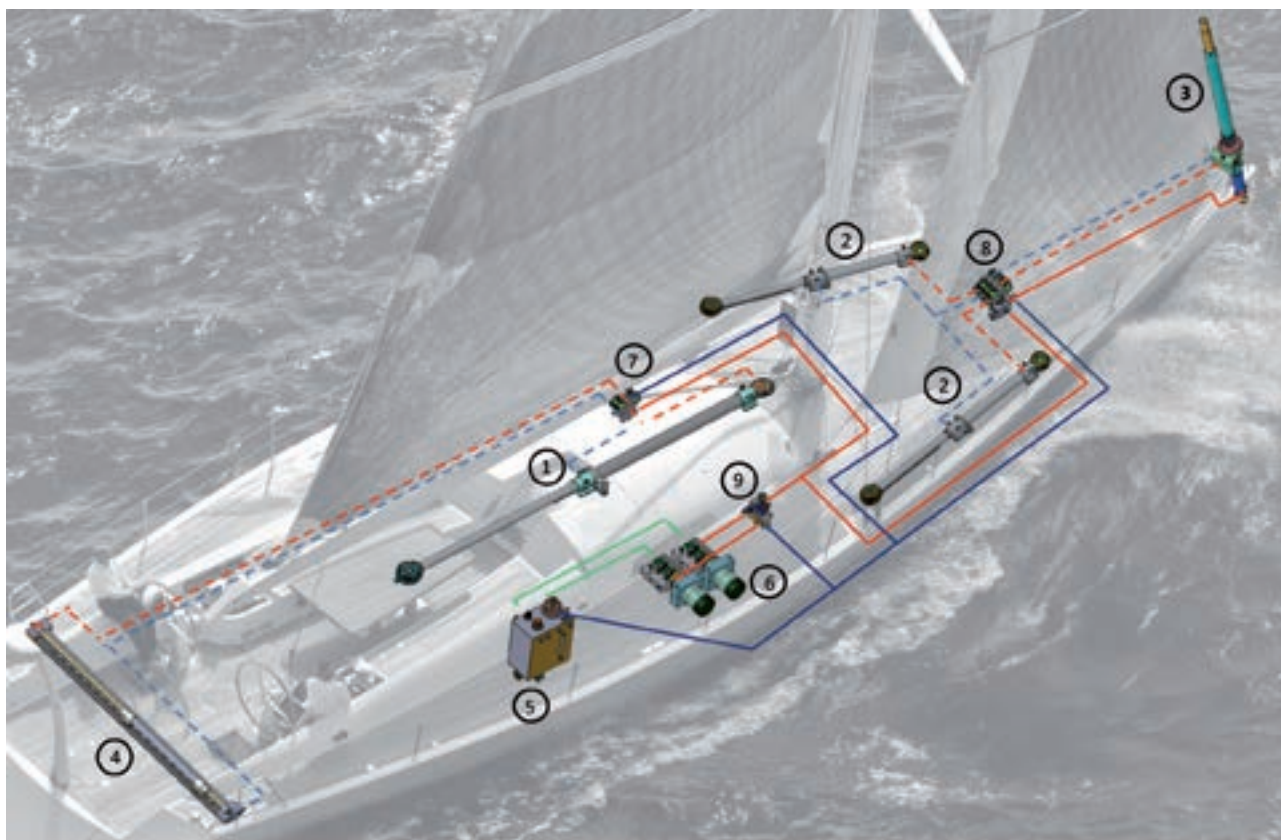


Wallynano 33' "Biancaneve" equipped with Easy Sailing System and Cariboni's hydraulic rams.



Solaris 60' with MagicTrim system for the mainsheet and and Hydraulic Easy Sailing System.

EASY SAILING SYSTEM 60' SKETCH EXAMPLE



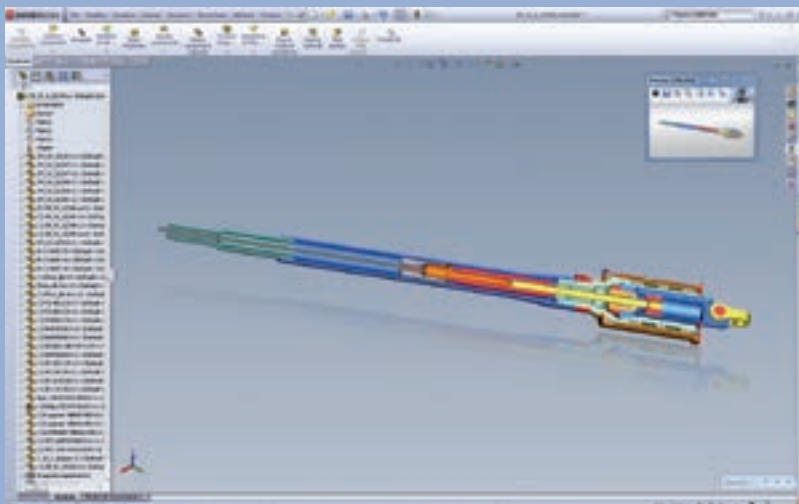
This is an example of a complete Easy Sailing System for a 60' fast cruising sailing yacht.

The system is composed by:

- 1** Magic Trim for the mainsheet; trim and fast speed both in hauling and easing.
Integrated linear sensors for full control of the mainsheet
- 2** Two Magic Trims for the jib sheets: trim and fast speed both in hauling and easing for each side.
Integrated sensors for auto-tacking system
- 3** Giro48P: hydraulic jib furler with hydraulic forestay for a better control of the sail.
- 4** Traveler: double acting double rods traveler system with bump system to release the main car
- 5** Lightweight aluminium oil tank with accessories to keep cool the oil
- 6** Two powerpacks with high pressure gear pumps and 4500 Watt electric engine to control mainsail and jib at the same time
- 7** Aluminium manifold block to control the mainsheet ram and the traveler system with quick release system and manual release
- 8** Aluminium manifold to control the jib sheet rams, the jib furler and the stay tensioner.
Automatic jib tacking system integrated in the manifold
- 9** Aluminium main manifold with proportional control of the speed of all the functions for a fine tuning

All Cariboni Easy Sailing Systems are supplied with custom electronic control and Easy Sailing System software; you can tune the ESS straight from your PC simply moving your mouse!

FURLER



Furler

Compact dimensions, lightweight and reliability are the key features for any marine high performance product.

Besides those qualities, obtained by a careful design and engineering, the use of the best materials and construction techniques, Cariboni hydraulic jib furlers have the exclusive integrated stay tension ram. This is essential when the mast has angled spreaders.

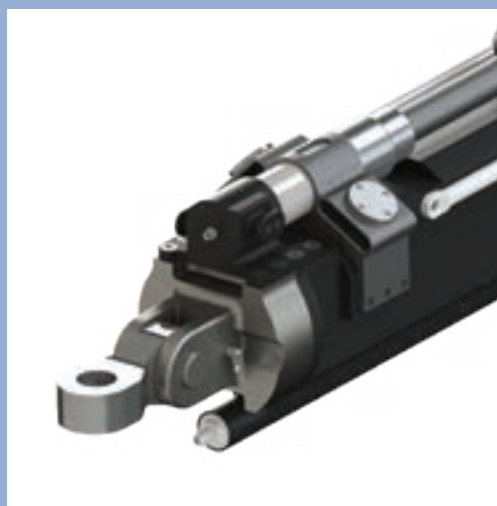
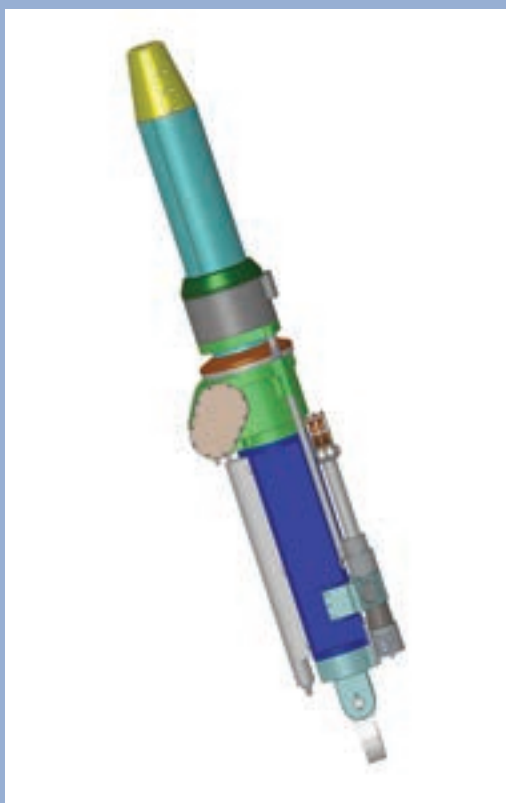
An additional ram on the stay increases the safety of the system; thanks to pressure valves on the stay line, unexpected problems of overload decrease.

For a complete rig setting the turnbuckle system allows a mechanical adjustment which doesn't depend from the hydraulic tuning.

The foil seat tube has numerous position to choose in order to find the best setup.



Structural furler GIRO ST 076P



CAPTIVE FURLER

It is a manual furler with integrated stay tension - ram. The rope is driven by a car into the spiral groove of a special drum. The car is driven by the same groove to set the rope

without any jumming for maximun safety. This compact furler system allows installation under the deck also for narrow bow yachts.

MODEL	Rod size	Furling rounds	Traction Load at 350 bar		Breaking Load		Cylinder stroke		Drum ø		Pin to tack distance		Furler weight		Oil volume
		n°	kg	lb	kg	lb	mm	in	mm	in	mm	in	kg	lb	litres
CF 30P	30	30	5340	11772	14000	30864	113	5,22	156	6,14	349	13,72	18	39	0,17
CF 40P	40	32	7127	15712	18000	39700	133	5,22	165	6,50	375	14,76	21	46	0,26
CF 60P	48 - 60	42	14516	32002	31000	68342	191	7,51	220	8,66	498	19,61	42	92	0,78

Materials

Furler: 6082T6 black hard coated aluminium
Spheres: Torlon®
Tack system: Dynema®
Rope: Dynema®

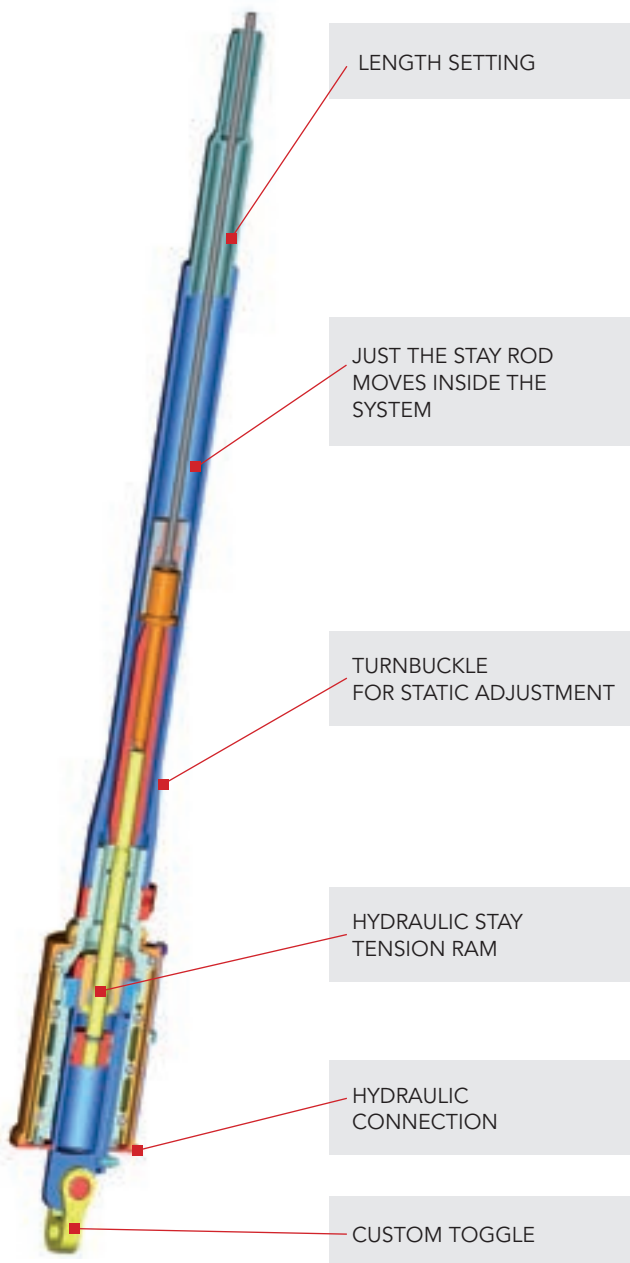
Cylinder tube: 17-4-PH stainless steel
Custom toggle: 17-4-PH stainless steel
Swivel: 6082T6 black hard coated aluminium



The captive furler drum with integrated stay tensioner.



Installation under the deck also for narrow bow yachts.





JIB FURLER

Compact dimensions, lightweight and reliability are the key features for any marine high performance product.

We offer several furler sizes, with integrated tensioner or without integrated tensioner.

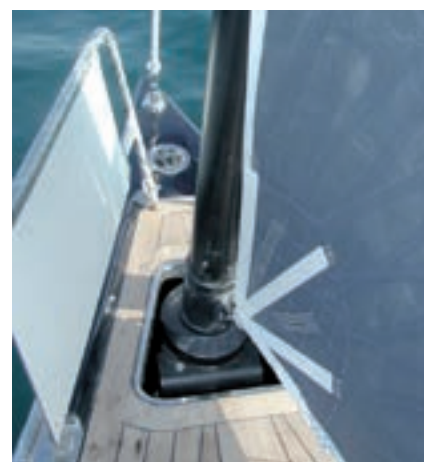
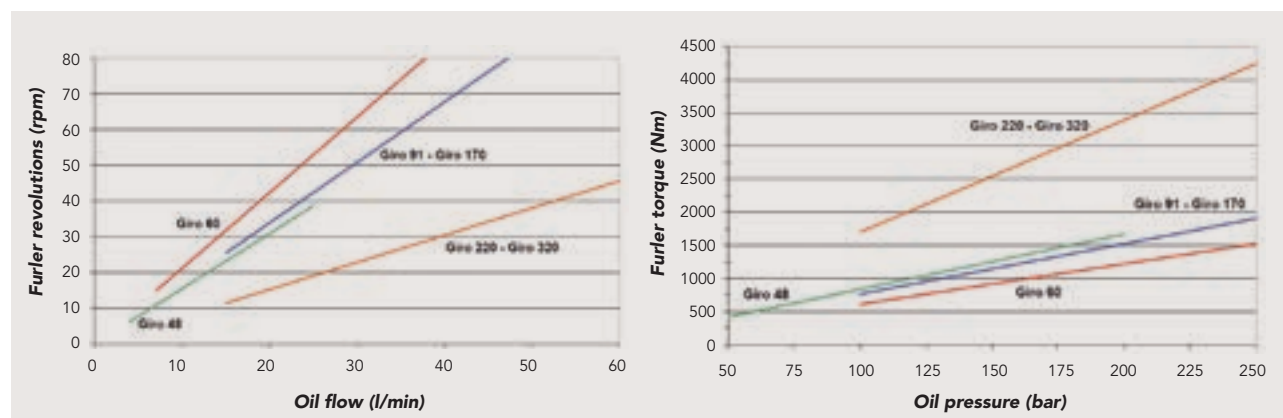
For a complete rig setting a turnbuckle system allows a mechanical adjustment independent from the hydraulic tuning. For a complete supply, aluminium and carbon fibre foils are available.

Lashing tack swivel and PBO arrangements for turnbuckle are available to increase reliability and reduce the overall weight of the rigging.



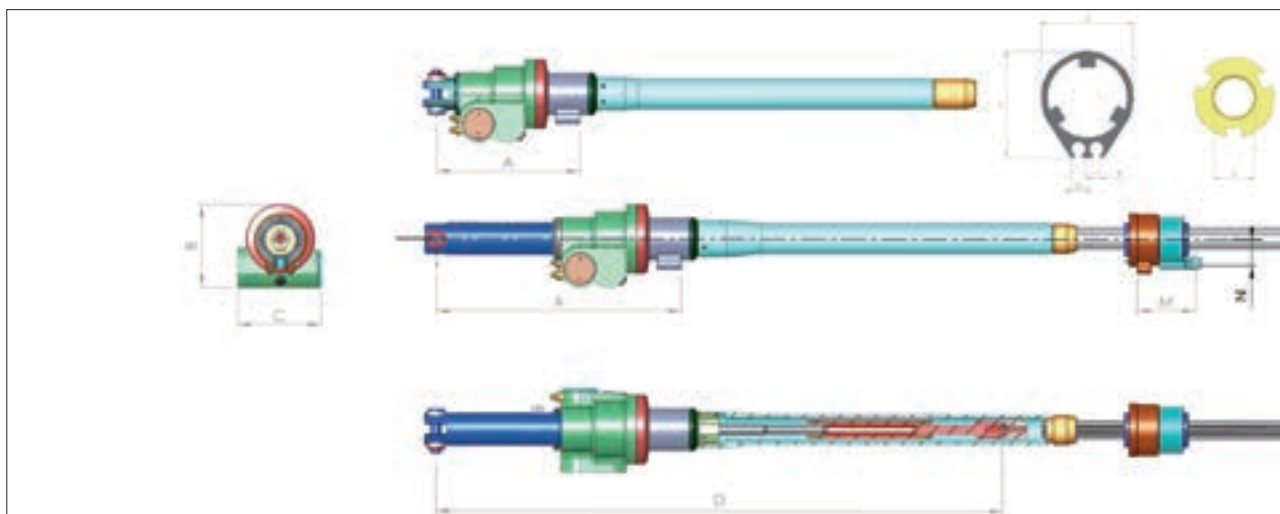
The full integrated hydraulic stay tensioner is an essential feature when mast has angled spreaders: with the fine tuning of the load on the forestay you increase the performances of the sails and the reliability of all the rigging.

MODEL	Stay rod size	Max furler pression		Stay tension ram stroke		Furler weight		Oil volume
		bar	psi	mm	in	kg	lb	
Giro 48P	48	140	2031	100	3,94	29,6	65,26	0,23
Giro 48	48	140	2031	-	-	21,5	47,40	-
Giro 60P	60-76	200	2900	110	4,33	57,8	127,43	0,55
Giro 60	60-76	200	2900	-	-	48,7	107,36	-
Giro 91P	76-91-115	350	5076	150	5,91	119,4	267,64	1,06
Giro 91	76-91-115	350	5076	-	-	92,4	203,70	-
Giro 170P	150-170	350	5076	205	8,07	197,2	434,74	2,44
Giro 220P	195-220	350	5076	202	7,95	246,0	542,32	2,74
Giro 320P	Up to 320	350	5076	250	9,84	289,0	635,80	6,35



Giro 91P and, on the bow, IG09000

JIB FURLER



JIB FURLER

MODEL	A		B		C		Dmax		Tstroke		Oil fittings (UNF JIC 37°)			
	mm	in	mm	in	mm	in	mm	in	mm	in	A	B	T	Ram
Giro 48	342,75	13,49	207,25	8,16	208,30	8,20	1160,50	45,70	205,00	8,07	9/16"	9/16"	-	-
Giro 48 P	596,25	23,47	207,25	8,16	208,30	8,20	1414,00	55,70	205,00	8,07	9/16"	9/16"	-	7/16"
Giro 60	402,00	15,83	262,50	10,33	229,80	9,05	1186,00	46,70	250,00	9,84	9/16"	9/16"	7/16"	-
Giro 60 P	698,90	27,52	262,50	10,33	229,80	9,05	1658,70	65,30	250,00	9,84	9/16"	9/16"	7/16"	7/16"
Giro 91	509,70	20,07	333,13	13,12	297,75	11,72	1536,60	60,50	250,00	9,84	9/16"	9/16"	7/16"	-
Giro 91 P	874,70	34,44	333,13	13,12	297,75	11,72	1901,60	74,87	250,00	9,84	9/16"	9/16"	7/16"	7/16"
Giro 170 P	963,00	37,91	354,86	13,97	313,00	12,32	1755,50	69,11	250,00	9,84	9/16"	9/16"	7/16"	7/16"
Giro 220 P	1017,00	40,04	406,00	15,98	356,00	14,02	2157,15	84,13	250,00	9,84	3/4"	3/4"	9/16"	7/16"
Giro 320 P	1180,00	46,46	406,00	15,98	356,00	14,02	2639,00	103,90	245,00	9,65	3/4"	3/4"	9/16"	7/16"

ALUMINIUM HEADFOIL

MODEL		X		Y		Q		R		S		Bar length		Weight*	
		mm	in	mm	in	mm	in	mm	in	mm	in	m	ft	kg/m	lb/ft
G 045	CF30	34,50	1,36	42,00	1,65	7,00	0,27	3,55	0,14	14,00	0,55	4,0	13,12	1,04	0,70
G 055 Giro 48	CF40	46,00	1,81	53,00	2,08	7,00	0,27	3,55	0,14	20,00	0,79	4,0	13,12	1,84	1,24
G 065 Giro 60-91	CF60	57,00	2,24	65,00	2,56	7,00	0,27	3,55	0,14	30,00	1,18	4,5	14,76	2,60	1,75
G 080 Giro 91		80,00	3,15	90,70	3,57	8,00	0,31	4,34	0,17	50,00	1,97	4,5	14,76	4,91	3,30

(*) Weight includes connectors

SWIVEL

MODEL	M		N		Max load		Weight	
	mm	in	mm	in	kg	lb	kg	lb
G 055	150,00	5,91	43,00	1,69	2600	5732	1,1	2,43
G 065	162,00	6,38	62,00	2,44	3600	7937	1,8	3,97
G 100	270,00	10,63	73,35	2,89	6000	13228	6,2	13,67



CODE ZERO FURLER

Our code zero furlers are the lightweight solutions to have an automatic furler to control code zeros by on board hydraulic. They have a 100% waterproof black hard coated aluminium body for top performances and reliability.

All our furlers have fast pins for quick connection of the sail; starting from IG 09000 size, a manual back-up system allows to furl the sail without hydraulic power. A special gear system doesn't let to unfurl the sail under high load and it doesn't keep pressure on the hydraulic system while sailing.

Many types of fixing ways are available for all sizes: custom length of chain plates turnbuckle available on request.



IG 09000 code zero furler

MODEL	Halyard Max working load		Max oil pressure		Min flow rate	Max speed @ max flow rate	Weight		Dimensions
	kg ⁽¹⁾	lb ⁽¹⁾	bar	psi	lpm	rpm @ lpm ⁽²⁾	kg	lb	mm
IG 04500	4500	9921	140	2030	4	68 @ 25	9,2	20,3	170x170x185
IG 09000	9000	19841	140	2030	4	48 @ 20	16,7	36,8	204x207x280
IG 16000	16000	35273	400	5800	7	105 @ 48	35,0	77,2	227x262x298
IG 23000	23000	50705	400	5800	15	215 @ 128	67,8	149,5	303x331x368
IG 47000	47000	103400	400	5800	15	150 @ 200	135	297	511x404x356

(1) Working load on halyard: traction load

(2) Example for IG 04500: 68 revolutions per minute with 25 litres per minute of oil. No higher flow is allowed.
For lower speed just reduce proportional the amount of oil. Faster model available on request.



An IG 09000 with a Giro91P on the bow of a 88' yacht

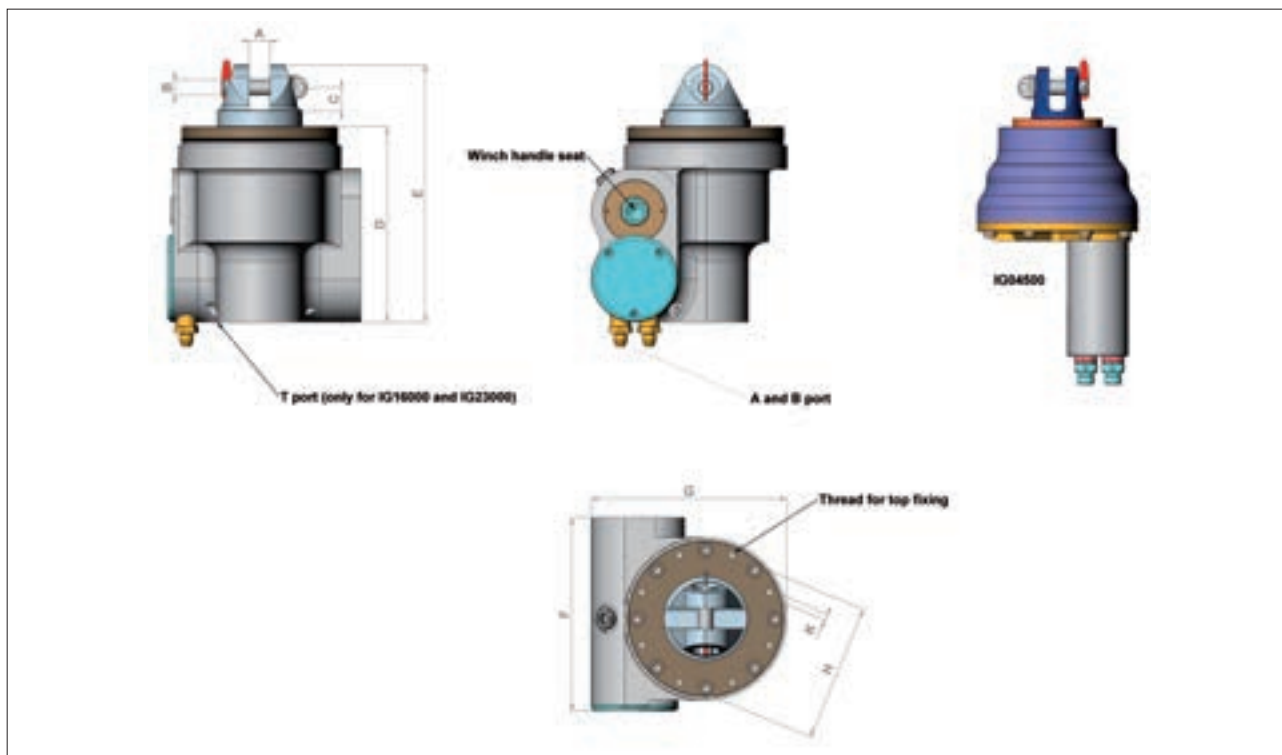


Cariboni's code zero furlers: from IG 04500 (left bottom) to the IG 47000 (top right). IG 47000 has a custom fork according to the stay terminal design

CODE ZERO FURLER

Here below all the main dimensions of our code zero furlers. IG 47000 has the T port too. The T port (or drain line) must be connected straight to the oil tank.

To be able to control a furler, only a directional valve is required. In case of no turning of the furler, it is not required to use hydraulic pressure to keep the system in the position or to avoid the sail to unfurl under load.

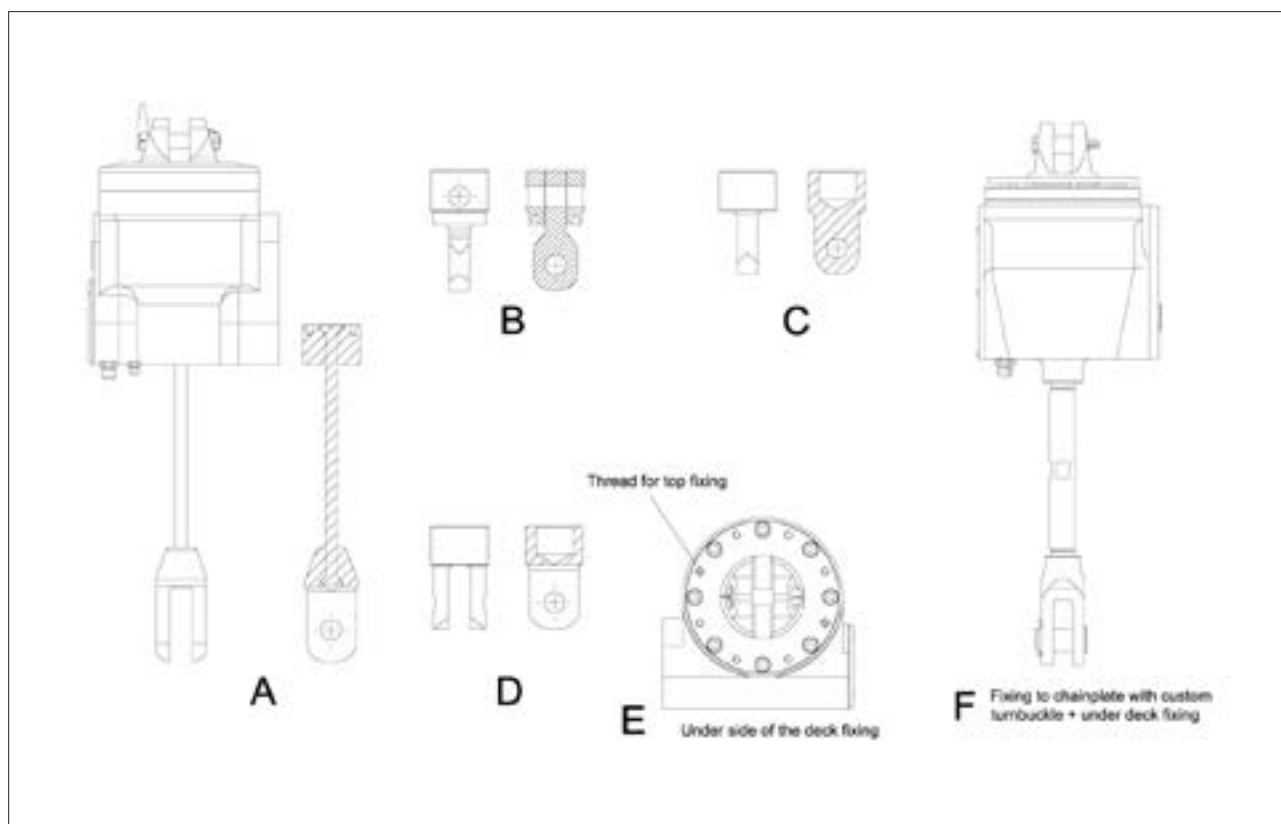


FURLER MAIN DIMENSIONS

The handle seat is on the opposite side for IG16000 and IG23000. No handle seat on IG04500

MODEL	IG 04500		IG 09000		IG 16000		IG 23000		IG 47000	
DIM	mm	in	mm	in	mm	in	mm	in	mm	in
A	18,00	0,71	22,10	0,87	24,00	0,94	30,00	1,18	70,00	2,76
B	16,00	0,63	16,00	0,63	22,00	0,87	28,00	1,10	70,00	2,76
C	25,00	0,98	24,00	0,94	38,70	1,52	50,00	1,97	75,00	2,93
D	129,00	5,08	206,97	8,15	217,81	8,58	257,20	10,13	321,00	12,64
E	183,25	7,21	280,47	11,04	299,50	11,79	269,70	10,62	511,30	20,12
F	170,00	6,69	204,30	8,04	227,30	8,95	303,05	11,93	352,25	13,86
G	170,00	6,69	207,25	8,16	261,57	10,30	331,13	13,04	404,50	15,92
H	110,00	4,33	146,00	5,75	150,00	5,91	240,00	9,45	310,00	12,2
K threads	n° 8 M8		n° 8 M8		n° 8 M8		n° 8 M10		n° 8 M16	
A and B port	9/16" UNF JIC 37°		9/16" UNF JIC 37°		9/16" UNF JIC 37°		9/16" UNF JIC 37°		3/4" UNF JIC 37°	
T port	-		-		7/16" UNF JIC 37°		7/16" UNF JIC 37°		9/16" UNF JIC 37°	

CODE ZERO FURLER



FIXING WAYS

All fixing systems but "E" and "F" need a box to support the furler weight.
 The box for system "A" must support also torque moment.
 Max angle between furler axis and luff of the sail is 15°.



IG 16000



IG 9000

STRUCTURAL FURLER

The furler is designed for a composite torque cable. The tension on the stay can be controlled with the high pressure cylinder inside the unit. The structural furler is lighter and smaller than a standard system as it is designed to completely furl and unfurl the sail. With the use of our top swivel the sail is furl both from bottom and top.

It can be designed with connection to the bottom bow or from the deck with an articulated connection.

The unit can be supplied with integrated Cunningham tensioner and/or linear sensor for the stay.

The Cunningham cylinder is a special version of a Simple Magic Trim which is fixed on the furler body.

The integrated linear sensor for the stay cylinder complete the unit for a full control, which can be automatically used to adjust the mast rake while tacking or gybing.



GIRO ST 080P

MODEL	Stay max load	Max tensioner pressure	Furler max oil pressure ⁽¹⁾	Maximum flow rate	Cunningham max load	Furl torque	Unfurl torque	Weight	Dimensions
	kg	bar	bar	l/min	kg	Nm	Nm	kg	mm
GIRO ST 070P STD	11121	418	140	20	6760	700	400	92	1620x370x261
GIRO ST 076P	21250	420	140	20	6000	700	400	127	1930x358x279
GIRO ST 080P	27500	500	140	20	6000	700	400	99	1719x358x279
GIRO ST 080P STD	19250	350	140	20	3500	700	400	107	1474x380x279
GIRO ST 120P	40000	495	250	100	9700	2000	1100	257	2191x620x500 ⁽²⁾

(1) The furler is designed to fully furl/unfurl the sail with no load on the sheet

(2) Deck installation





FOIL SWIVEL

MODEL	M		N		Max load		Weight	
	mm	in	mm	in	kg	lb	kg	lb
G 055	150,00	5,91	43,00	1,69	2600	5732	1,1	2,43
G 065	162,00	6,38	62,00	2,44	3600	7937	1,8	3,97
G 100	270,00	10,63	73,35	2,89	6000	13228	6,2	13,67



CODE 0 SWIVEL



MODEL	J		W		X		X1		Z		Max load		Weight	
	mm	in	mm	in	mm	in	mm	in	mm	in	kg	lb	kg	lb
FST 05 045	10,0	0,39	110,5	4,35	16,0	0,63	20,0	0,79	61,0	2,40	4500	9920	1,0	2,2
FST 06 4001	12,5	0,49	147,6	5,81	22,0	0,87	23,5	0,93	69,1	2,72	9000	19842	1,4	3,1
FST 08 016	18,0	0,71	211,5	8,33	30,0	1,18	27,5	1,08	105,0	4,13	16000	35274	3,9	8,6
FST 10 023⁽¹⁾	30,0	1,18	362,0	14,25	30,0	1,18	50,4	1,98	180,0	7,09	23000	50706	41,8	92,2

(1) Stainless steel version

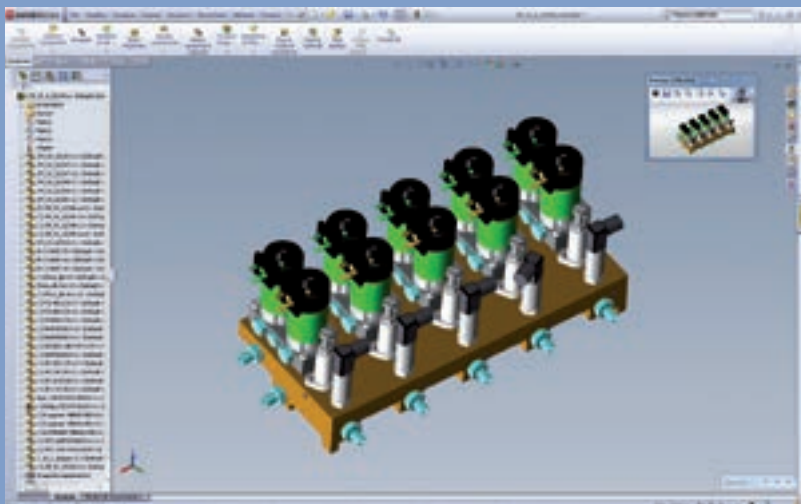
STRUCTURAL FURLER SWIVEL

MODEL	Pin to pin		Max body diameter		Max load		Weight	
	mm	in	mm	in	kg	lb	kg	lb
FST 060	308 ¹	12,1	164	6,46	6000	13228	9,3	20,5
FST 120	225	8,9	87	3,43	12000	26455	5,0	11,0
FST 160	228	9,0	89	3,50	16000	35274	4,8	10,6
FST 190	239	9,4	108	4,25	19000	41800	7	15,4
FST 200	255	10	108	4,25	20000	44000	7,5	16,5
FST 220	316	12,4	144	5,7	22000	48400	14,2	31,24
FST 260	257	10,1	97	3,81	26000	57320	5,4	11,9
FST 270	326	12,8	154	6,06	27000	59400	14,8	32,5
FST 330	315	12,4	124	4,88	33000	72600	12,5	27,5
FST 240 LOCK	524	20,6	186 x 110 ²	7,32 x 4,33 ²	17500 ³	38500	14,4	31,7
					6500 ⁴	14300		
FST 260 LOCK	399	15,7	175 x 96 ²	6,89 x 3,78 ²	20000 ³	57320	10,5	22,5
					6000 ⁴	13228		
FST 290 LOCK	424	16,7	186 x 110 ²	7,32 x 4,33 ²	19000 ³	50706	12,2	26,9
					10000 ⁴	13328		
FST 300 LOCK	411	16,2	189 x 114 ²	7,44 x 4,48 ²	20000 ³	44000	29	63,8
					10000 ⁴	22000		
FST 570 LOCK	528,4	20,8	175 x 270 ²	6,89 x 10,6 ²	40000 ³	88185	50	110
					17000 ⁴	37479		

(1) swivel total height, (2) maximum body transversal dimensions, (3) stay maximum load, (4) lock maximum load

FST 11 260
Titanium stay swivelFST 04 060
Titanium openable
halyard swivelFST 11 260 LOCK
Titanium stay swivel
with integrated halyard lock

HYDRAULIC SYSTEM



We design, build, install and test the whole hydraulic system of a sailing yacht: power-packs, piping, manifolds, electric controls, with basic or special hydraulic devices.

Our guide lines are:

- Reliability
- Lightness
- Innovative & Technological approach

Reliability

It is important for us to have a strong relationship with our suppliers: we create our system with the collaboration of technical offices in order to have always the best solution. Hydraulic components, electric engines and electronics controls are all tested

in our firm. We supply our standard systems with stainless steel fittings to avoid problems of rust.

Lightness

Gear pumps for medium and high pressures (up to 700 bar) are made of lightweight aluminum alloy and fit electric engines with aluminum flanges and 17-4 PH joints.

Innovative & Technological approach

For medium size systems, we supply de-located manifold arrangements which reduce the length and the weight of hoses and increase reliability.

Cariboni special basic powerpack configuration includes a single electric motor combined with three autoshift pumps: at low pressure all the three pumps work to get the maximum oil flow; at medium pressure one pump is excluded, at high pressure only one works. The current consumption is quite constant in all the ranges of pressure. This allow the use of the electric motor for longer time without overheating and overloading it.



Cariboni PLC system, oil tank and powerpack for a 53' sailing yacht hydraulic system

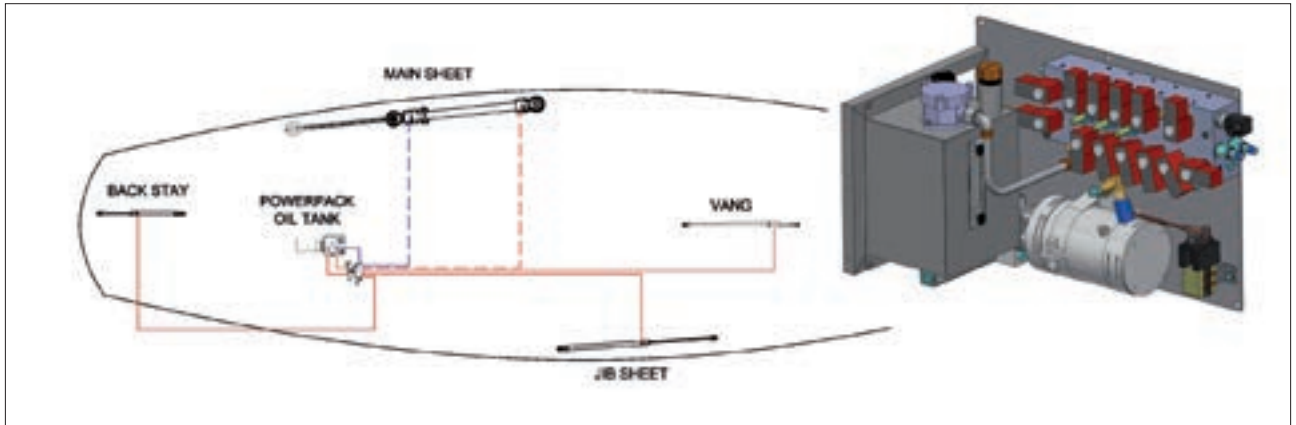


COMPACT ARRANGEMENTS

For small boats, we create a compact system with oil tank, powerpak and manifold, all made of aluminium alloy. With this hydraulic system the installation on board gets easier and faster: the shipyard has only to fix the panel with few screws and plug the hoses to the cylinders.

Here below an example of easy sailing hydraulic system of a yacht:

- Magic Trim for main sheet
- Two single acting cylinders for jib sheet and backstay
- Vang cylinder
- Compact hydraulic powerpack with integrated oil tank and valves block



Custom compact hydraulic system for a 33' sailing yacht

CUSTOM ARRANGEMENTS

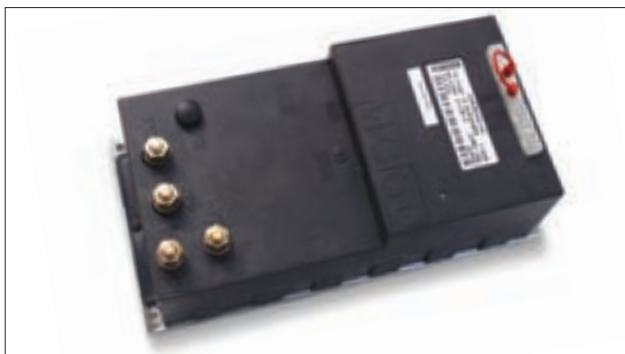
The hydraulic system of Cariboni has been improved year by year with ultimate high-tech solutions.

Proportional valve is getting a benchmark for sailing environment and is a standard for our professional system. The proportional controls of flow and pressure on hydraulic systems reduce un-wanted peaks of pressures and increase the control of hydraulic devices and their reliability. We verify this technology in several yachts, on their canting keel systems, for example.

A proportional board, with full marine coating and wide trim settings, is used in our PLC control to avoid any rust problem.



Canting keel manifold VOR 65 with proportional valves



Softstart device for a 6000 Watt electric engine

In order to increase electric efficiency and the lifetime of electrical engine, we supply the softstart device together with our powerpack. This system controls the current consumptions of DC electric engine, getting a soft and smooth start and stop. Softstars are a must for bigger electric engines (over 4500 watts) in order to increase the available hydraulic power without increase too much the batteries size.

ELECTRIC PUMPS AND PTO

We supply high performance powerpack for fast cruiser or race yachts. This kind of powerpack has a special high-pressure pump, made of light aluminium alloy, able to reach up to 700 bar (10.000PSI).

If high pressure and high flow rates are required, special dual stage pistons pump are available with custom flange to fit high performance DC electric engine.

We design and assemble single and multi-electric pumps to satisfy all the customer needs. Our pumps can be used to drive Magic Trim cylinders, single or double acting cylinders, furlers, winches, anchor stowing systems and whatever needs hydraulic power!



An example of three 700 bar electric powerpack with 4500 and 3000 Watt electric engines

MODEL	Power	Voltage	Max flow @ 250 bar	Max flow @ 350 bar	Dimensions ¹		Weight ¹	
	W	V	l/min	l/min	Mm	in	kg	lb
1x2000	2000	24	3,8	2,7	Ø 128 x 314	Ø 5,0 x 12,4	10	22
1x2500	2500	12 or 24	4,8	3,4	Ø 130 x 342	Ø 5,1 x 13,5	13	28,6
1x3000	3000	24	5,8	4,1	Ø 130 x 342	Ø 5,1 x 13,5	13	28,6
1x4500	4500	24	8,6	6,2	Ø 161 x 472	Ø 6,3 x 18,6	27,5	60,6
1x5000*	5000	24	9,6	6,9	Ø 205 x 385	Ø 8,1 x 15,2	21,6	47,6
1x6000	6000	24	11,5	8,2	Ø 191 x 675	Ø 7,5 x 26,6	69	152

⁽¹⁾ indicative values depending on the type of pump installed

We produce special oil pumps arrangements and complete service units for race boats and fast cruiser boats. A basic hydraulic system, made by a single cylinder, can be managed with a mini powerpack which can pump, however, at high pressure.

For bigger hydraulic systems of fast cruising boats, Cariboni designs, builds and tests custom solutions to plug hydraulic pumps on marine generator with clutch.



Rexroth pump assembled with custom clutch on 27kW Mastervolt generator PTO.
Flow rate = 67.5 lit/min
Max pressure = 250 bar



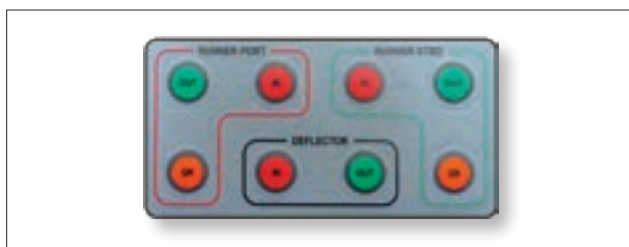
Complete service units on Volvo diesel engine for Volvo Ocean Race.

PUSH BUTTONS PANELS

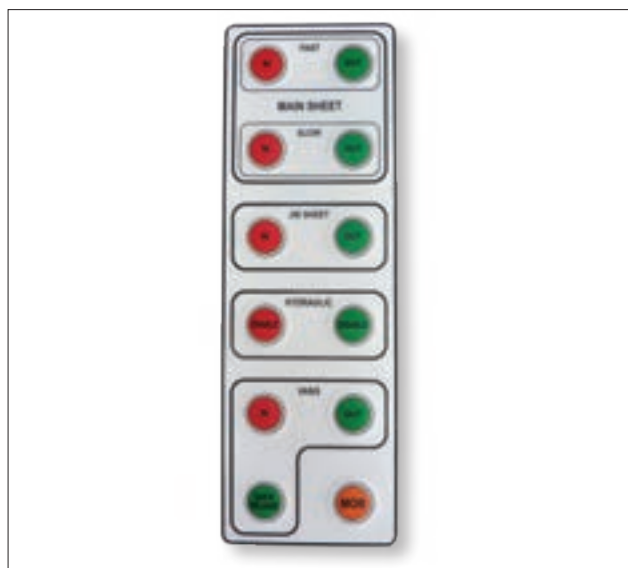
Waterproof button panels with customized graphic layout. Panels are equipped with dome push buttons with LED backlights (a visual feedback signal for each button). Supply voltage is 24 VDC with IDC 8x2 connectors. They can be installed both horizontally or vertically and they look flat.

It is possible to get CAN BUS push buttons panels, with n.1 M12 output cable.

The panels are supplied with a standard 2,5m cable (it can be shorter or longer upon request).



An example of Push buttons panel, 8 buttons



An example of Push buttons panel, 12 buttons

Buttons	Without CAN BUS		With CAN BUS	
	Dimensions	Weight (2,5m cable included)	Dimensions	Weight (2,5m cable included)
	mm	g	mm	g
2 ⁽¹⁾	100 x 40 x 14	250	-	-
3 ⁽¹⁾	140 x 40 x 14	270	-	-
4 ⁽¹⁾	180 x 40 x 14	284	-	-
4	80 x 80 x 14	340	80 x 80 x 23	342
6	120 x 80 x 14	360	120 x 80 x 23	434
8	160 x 80 x 14	660	160 x 80 x 23	554
10	200 x 80 x 14	720	200 x 80 x 23	674
12	240 x 80 x 14	750	240 x 80 x 23	794

(1) inline buttons

HYDRAULIC WINCH MOTORS

Our light winch motors have been designed to provide high speed, high efficiency and low weight thanks to the body in hard coated aluminium. They can be installed on any winch model.

The clutch feature can be added to the motor on request.



Hydraulic winch motors

MODEL	Displacement	Specific torque	Peak pressure	Max rotational speed	Dimensions (Ø x length)	Weight
	cc/rev	Nm/bar	bar	rpm	mm	kg
M A 075	86	1,37	375	700	205 x 190	14
M A 110	115	1,83	400	650		
M A 130	129	2,05	375	650		



HYDRAULIC DREAM

Terminated on 2007, this astonishing 60 feet is still a benchmark for sail word in terms of style and hydraulic automation.

Designed by Tony Castro, "*Sizzler*" (name of the boat), is a wood day sailer, fully automatic.

Sizzler has:

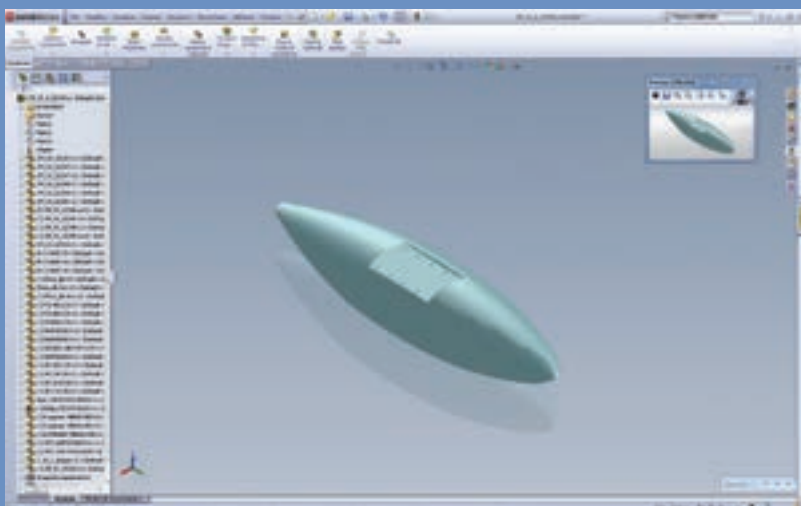
- MagicTrim for mainsheet control
- MagicTrim for jib sheet with easy sailing system
- Double acting vang with linear sensors for main furler
- Jib furler with hydraulic tensioner
- Hydraulic outhaul, halyard and backstay
- Hydraulic winches
- Bow and aft thrusters
- Lifting keel with locking system
- Hydraulic lifting cockpit table
- Hydraulic sliding doors

All these devices are driven by Cariboni's hydraulic system, controlled with two joint PLC.

However, the most impressive thing is the arrangement of all these parts in the boat: the Magic Trim cylinders are installed on a carbon fibre structure like sculptures. All the pipes are made of polished stainless steel hose, hand bended and fixed on the boat by custom made wood rings. At the end, a spectacular light system underline the flush deck and all the on board equipment...



BULB - FIN



Cariboni produces and machines at the CNC milling machine bulbs for performance sailing yachts.

The bulb production started with the re-fitting of a new GP42 by Barracuda Yacht Design.



JP 54 Hydraulic system

BULB

The advantages of a CNC milled bulb are:

- Best control of hydrodynamic shape to increase under-water performances
- Sharp control of the bulb weight and its center of gravity
- Lower center of gravity compared to fin & bulb forged system

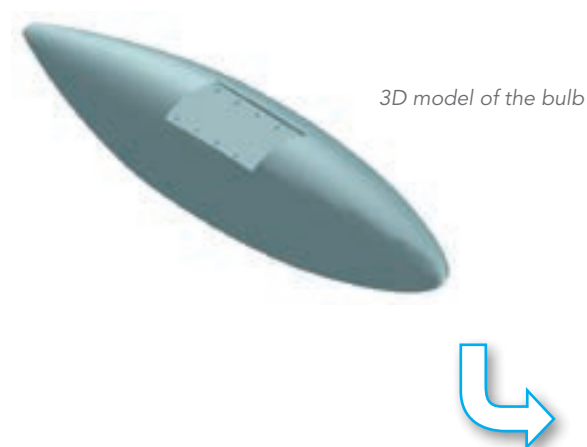
The steps to create a bulb are:

- 3D model with the surfaces and the details to attach it to the fin
- Starting from the 3D design we machine out a plastic model of the bulb which will be used to build the mould for the real lead one
- The lead is placed on our CNC milling machine to get the final shape.

We can produce any size of bulb: from the small 2 tons unit for the GP42 race up to the 7 tons for a fast cruiser. Bigger bulb are also available on request.



Above you can see two 3D models of bulbs



CNC milling machine



Bulb ready to be painted

FIN

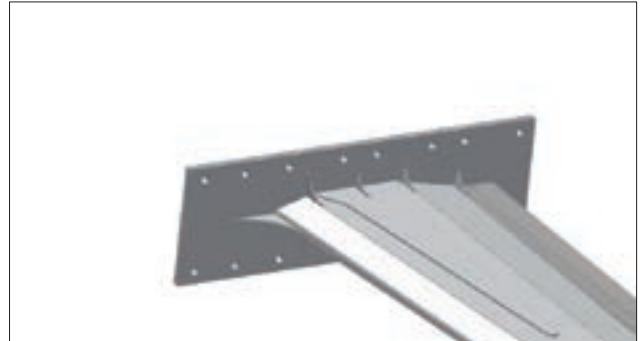
We have a long experience in fins design and construction for any kind of sailing yacht.

Fins can be created from a forged piece of high strength steel or welding sheets of Weldom material to have a lighter solution for higher performances.

For high performance sailing yachts, we offer our 17-4PH fin. This kind of fin is made starting from a forged block of material, which is machined with our milling machine, in order to obtain a light and small beam that will be the core of the fin.



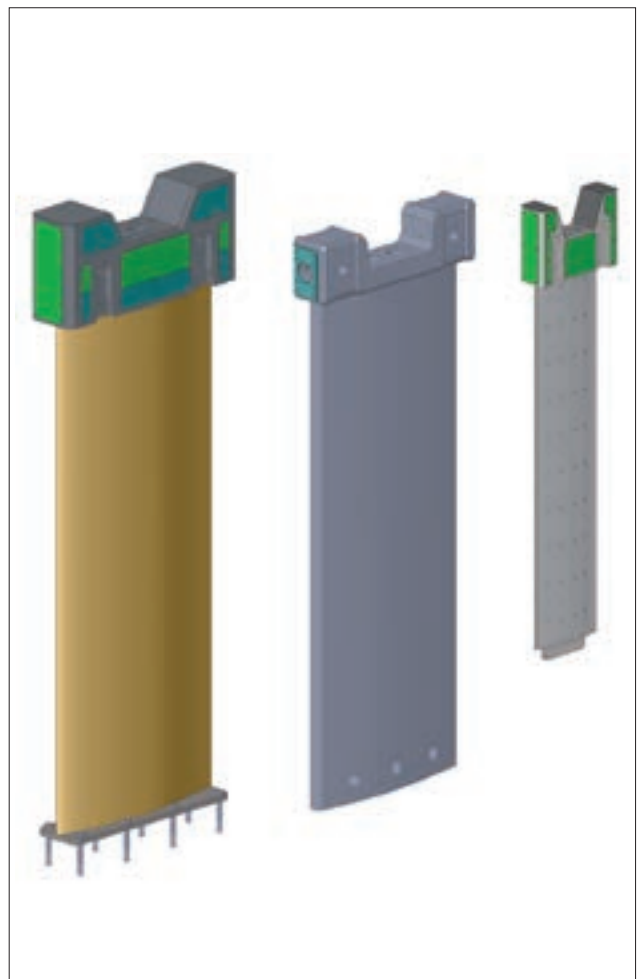
The fin on the left is CNC milling machined from a forged block to obtain the right shape.
The one on the right is a welded fin made of Weldom.



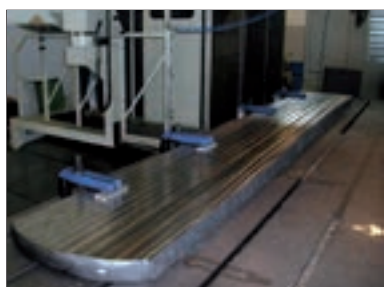
A detail of the upper part or the pin with the reinforcements.



The lifting keel fin for a Comet 100' sailing yacht.



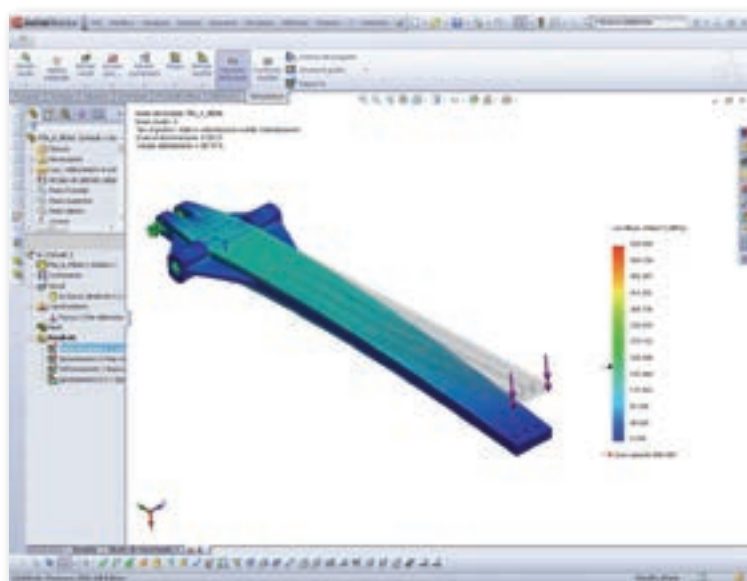
From left to right, the fin for a 100', 82' and for a 40' racing sailing yacht.



A 3400mm of forged 17-4-PH steel at the CNC milling machine.

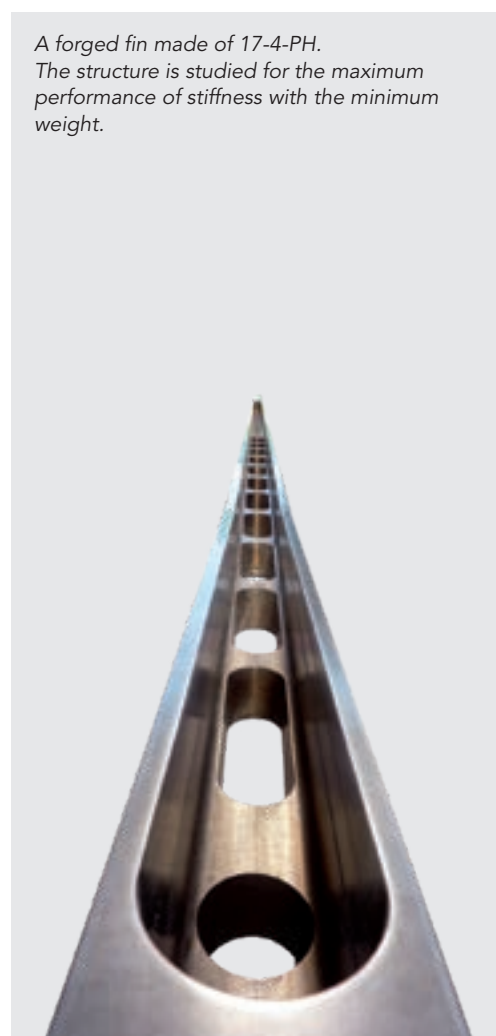


- 1 / 2:** Two examples of canting keel fin made of 17-4-PH stainless steel. Both fins are machined out starting from a forged piece of steel and then finished at the CNC milling machine.
- 3:** It is a welded model of Weldom steel: this fin has the rotating axis welded on the fin head.



An example of stress study on a 67' canting keel fin.

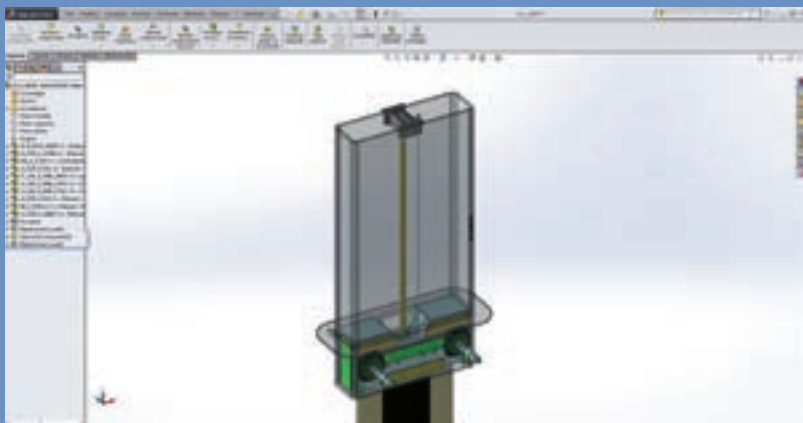
A forged fin made of 17-4-PH.
The structure is studied for the maximum performance of stiffness with the minimum weight.



The JP54 with Cariboni welded fin.



LIFTING KEEL



The possibility to lift the keel can allow an easy entry in shallow water harbours without reducing the performance of the boat. The peculiarity of our lifting keel system is that the fin is allocated, when in lower position, on 4 pins that contribute to transfer the loads to the keel box.



Botin 65' Caro
Lifting keel system



LIFTING KEEL

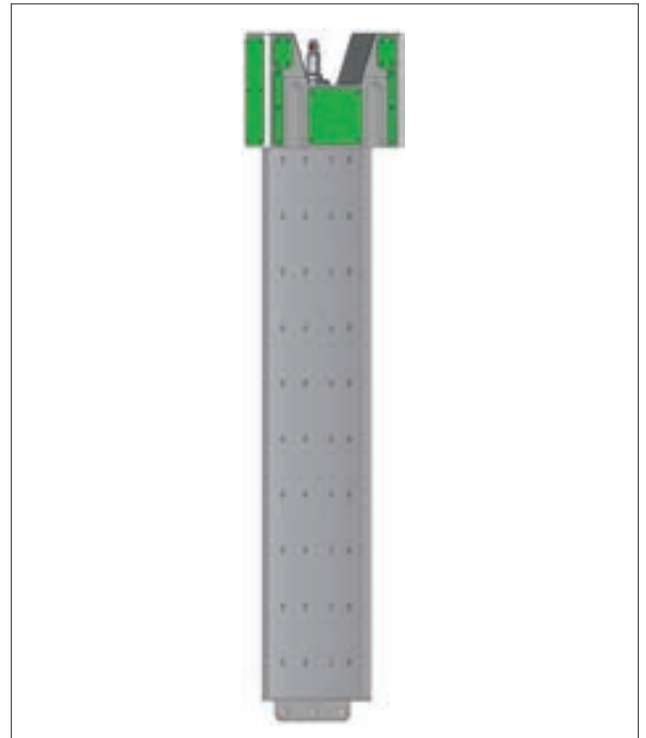
The main elements of our standard lifting keel system are:

- **Keel head:** made of stainless steel, with sliders with low friction and reduced swell water characteristics. Machined at CNC milling machine, it is completed with seats for the 4 pins.
- **Lifting keel cylinder:** it is a double acting cylinder made of 17-4-PH flanged on the head.
- **Cylinder support:** made of stainless steel, it is placed on the top of the trunk and it is designed to support the weight of the keel and the bulb.
- **Keel pins:** made of stainless steel, they're the core of our keel system; they contribute to hold the loads and they give stability to the system while sailing.
- **Locking cylinders:** made of stainless steel, they keep the keel in position in case of capsize and they avoid lateral movement when the keel is lifted.

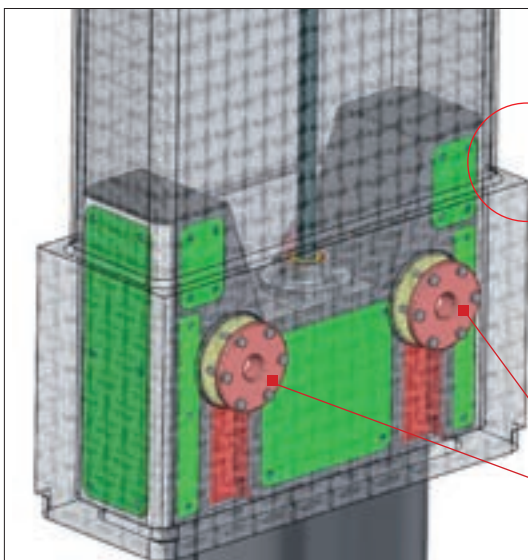


Class 40' by Cantieri Navali d'Este

- **Keel box:** usually made of the same material of the boat (carbon fiber or fiber glass). To obtain the internal correct dimensions, we machine at the CNC milling machine a pre-size male mold.
- **Fin:** it can be made of several materials, like Weldom, SAF or forged stainless steel.
- **Testing:** keel box, fin, cylinder and pins are tested all together prior shipping to assure the perfect sliding inside the keel box.



40' Cruiser-racer lifting keel fin



When the keel is full down it is stuck on the pins without any chance to have unwanted movements

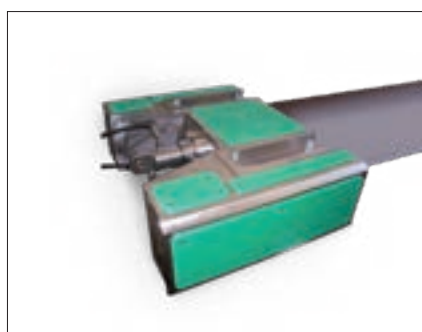
The trunk has reinforced sections in the lower part in order to keep grounding load as for other kind of systems

Pins are placed on the lower part of the trunk and they transfer the loads to the keel box even in case of grounding

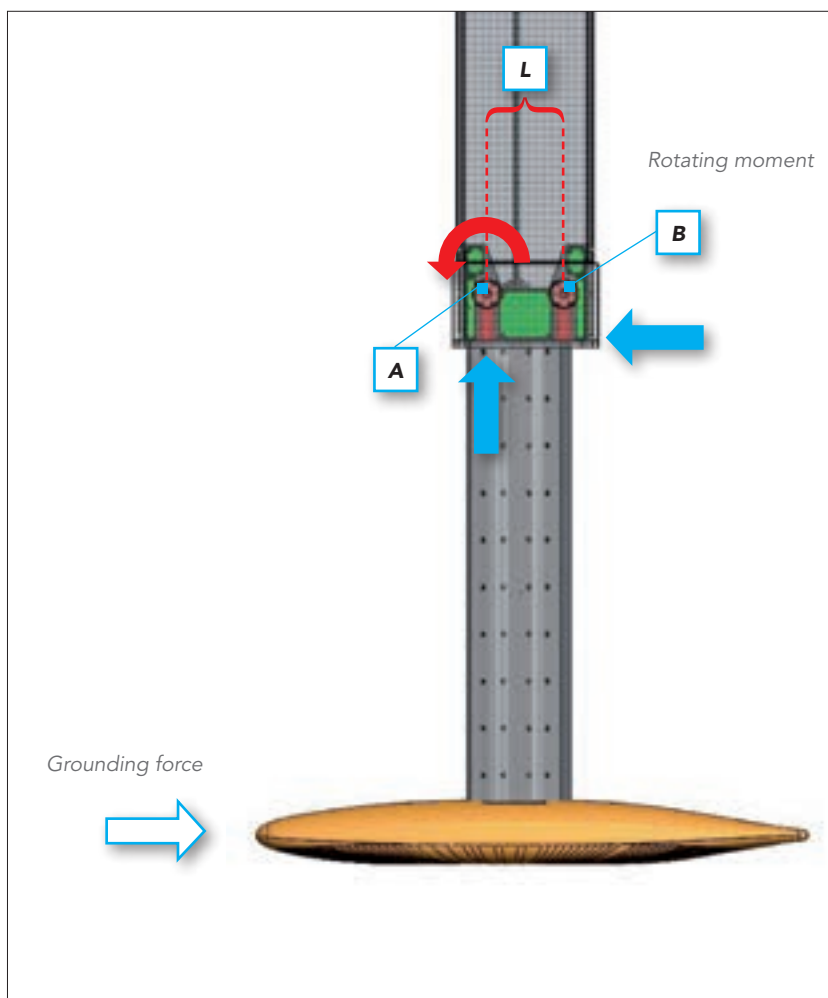
LIFTING KEEL

If a grounding occurs, the keel pins contribute to transfer the loads to the keel box. The grounding load pushes the system to rotate around pin A.

- **Pin A** keeps the horizontal load to balance the grounding load.
- **Pin B**, thanks to the stiffness of the keel head, contributes to keep the fin in position and it transfers the load to the keel box through the pins and the sliding guides.
- The pins are placed as far as possible between each others in order to give good stability to the system (L).
- Lifting cylinder doesn't keep any load higher than the designed compression load. The cylinder can keep the fin and the bulb in position if the capsize occurs.

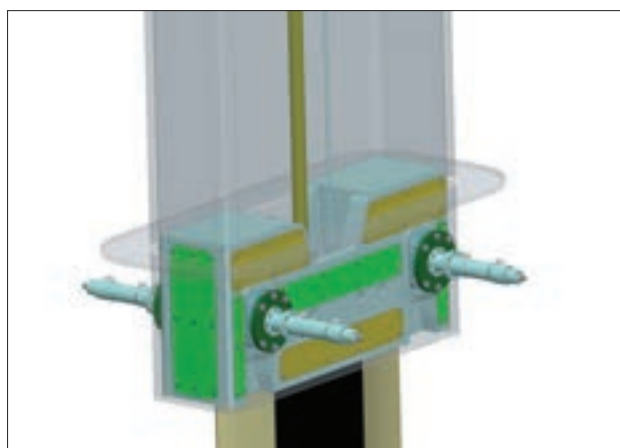


Fin head



Loads in grounding scenario

On the keel pins, it is possible to connect locking cylinders made of stainless steel.



Locking system example in a 65' sailing yacht

When the keel is up, the cylinders push against the keel shape to reduce any noisy movement of the keel at the mooring. They have an integrated linear sensor used for the logic of the lifting keel system.

The locking cylinders increase the security of the system in particular in case of capsize.



Freya 60' by Knierim Yachtbau

LIFTING KEEL

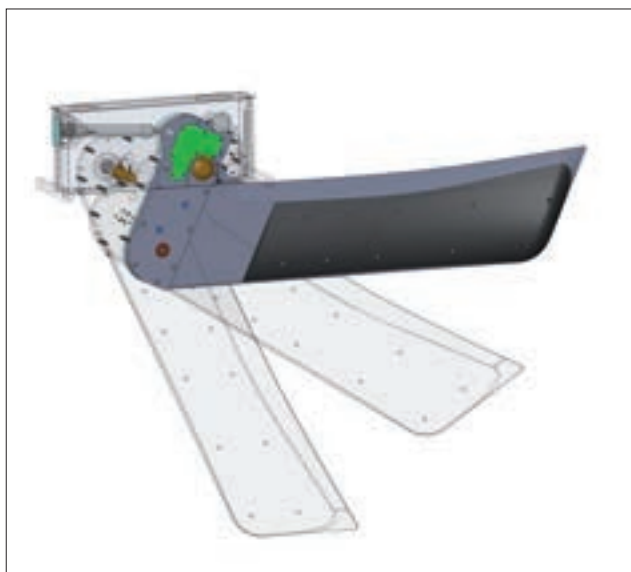
For small boats, it has been developed a lifting keel system which can easily be placed eventually inside the table basement. When the keel is down, the required space is reduced to the minimum.

The system is composed by two hydraulic cylinders and a compact hydraulic powerpack.

Systems in different heights are available on request.



The lifting keel system for a 31' day sailer

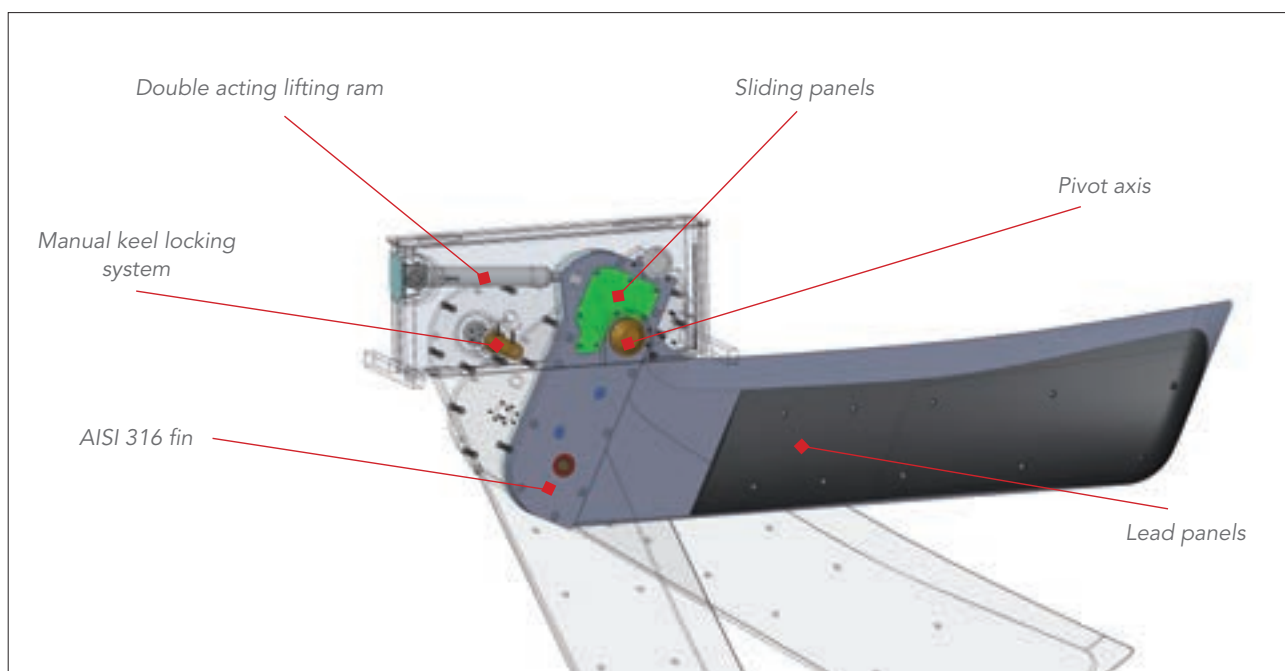


The pivoting keel assembly for a 35' day sailer

Another way to improve the shallow water performance of a sailing boat is a swinging keel as the one we designed and machined for a 35' project.

The keel has a pivot axis transverse to the boat. A double acting ram moves the keel up and down in order to reduce the overall draft of the boat (from 2m to 0,58m); the hydraulic ram, the bearings and the main axis are fully contained inside the watertight keel box.

The keel is powered by a compact DC powerpack. The system is completed by a recovery and a manual locking system.



Main items on a pivoting keel

LIFTING KEEL RAMS

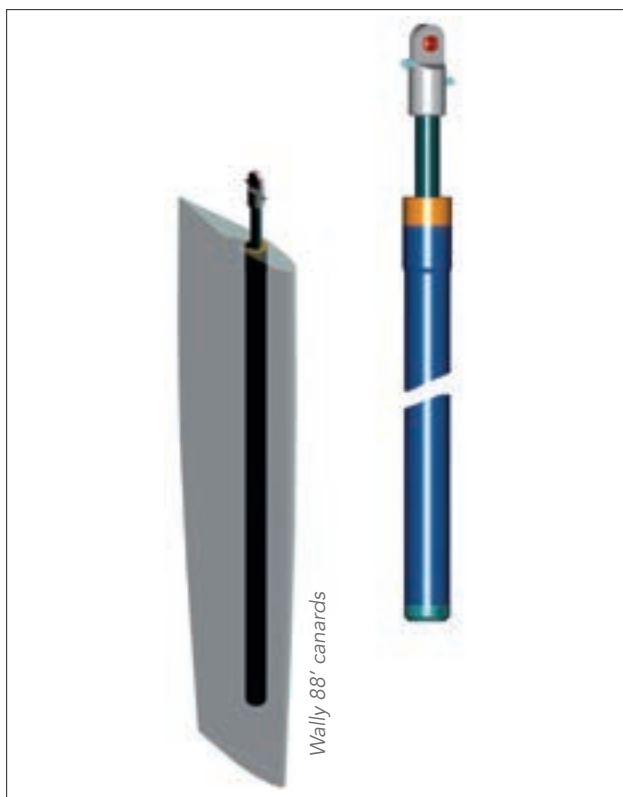
We supply also other types of lifting keel systems and hydraulic cylinders.

There are many ways to control a lifting keel and connect the lifting ram between the fin and the boat structure; the three typical systems are shown in the following images:

- **flanged connection**
- **bearing connection**
- **pin connection**

Both flanged and bearing connection reduce the rod buckling problem and the size of the cylinder. The flanged connection arrangement needs a very precise guide system (0,5 ° max keel moving) while it is not required in the bearing connection.

The pin connection is used when there are no buckling problem, as for a canard.



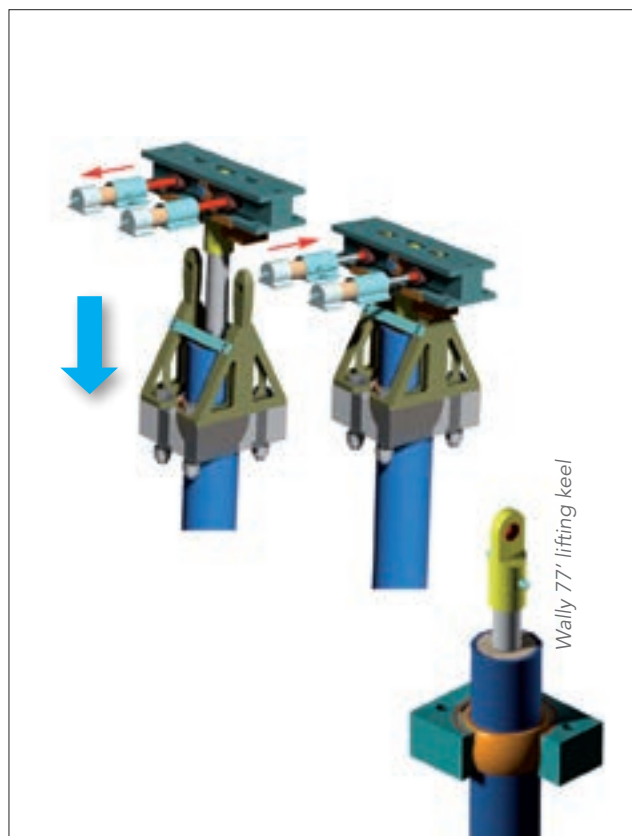
Pin connection

The rod terminal has a spherical joint to be fixed on the boat structure.

The cylinder tube is fully inside the fin.

The tube terminal has a hole to hold the fin by a pin.

This system is often used for canards.

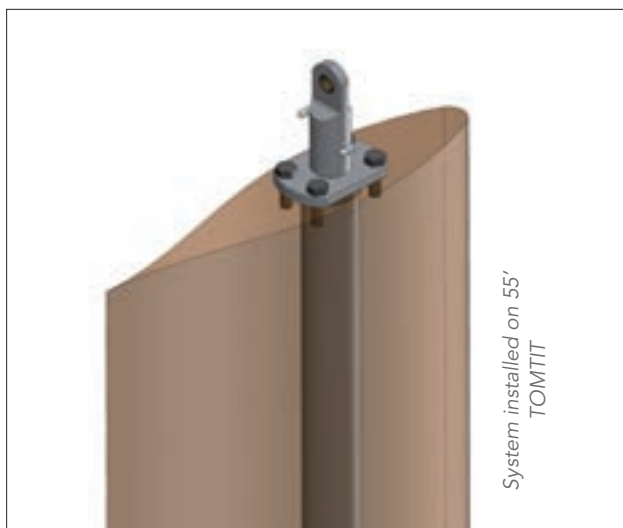


Bearing connection

The spherical bearing is placed on the top of the fin.

The rod terminal has a spherical fixing part.

The tube of the cylinder is inside the fin.



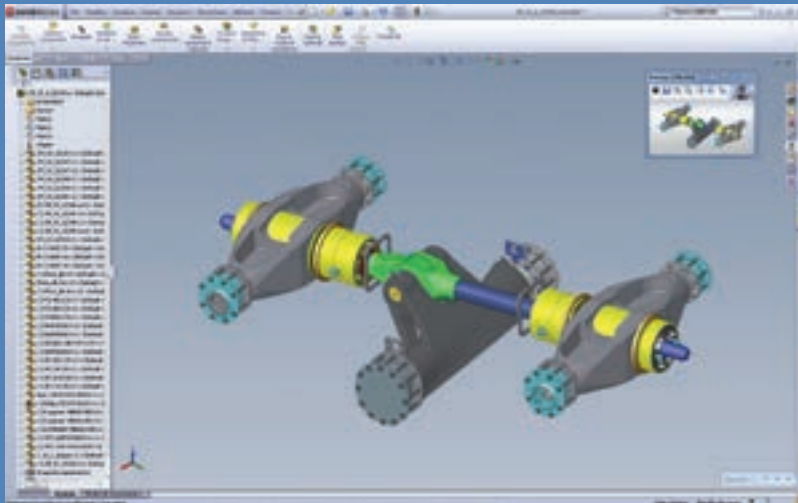
Flange connection

The cylinder tube head has a flange bolted to the fin. The rod terminal has a spherical bearing to allow small misalignment of the system.

Both oil fittings are placed on the rod terminal in order to avoid any movement of hoses.

The cylinders are usually made of stainless steel with structural parts made of high strength 17-4-PH.

CANTING KEEL SYSTEM



The canting keel feature dramatically improves the righting moment of the boat allowing more power for race yachts or more comfortable sailing for cruisers.

Cariboni's experience in canting keel systems dates back to 1996, when *Junoplano* was designed; this single ram system, with a $\pm 55^\circ$ canting angle, has been a milestone in sail history.

Cariboni designs and supplies canting keel system with:

- A single double acting cylinder
- Two double acting cylinders
- With integrated aluminium or stainless steel frame
- JIG system to build the keel bulkheads
- Aluminium, stainless steel and titanium rams

In every kind of canting keel, the system is watertight: the central part (where the keel head moves) is flooded, but the cylinders work in a dry area guarantee by special custom rubbers, placed between the rams and the longitudinal plates.

The keel frame allows to have a self-contained canting structure easily to be placed inside the boat. The shipyard has just to pick-up the structure and fix it between the two main bulkheads. The loads transmitted to the boat structures are exactly the same loads of a standard fixed keel. These kind of systems are installed on several Wally boats and on the 60' race-cruisers "*Junoplano*", "*Kratos*" and "*Anyway*".

In the image you can see the canting keel system of the 105' Wally "*Kauris III*" designed by German Frers.

In order to reduce the overall weight of the canting keel, we developed an integrated system which doesn't need a frame as all the parts are placed straight on the boat bulkheads. A JIG structure is supplied to the shipyard to place the bulkheads correctly aligned and drilled inside the boat.

These canting keel mechanisms without frame are installed on most of the racers boats.



*Cariboni's keel system with frame
for a 105' sloop.
This kind of system is fully tested
in the firm before shipping.*



MY SONG 80'



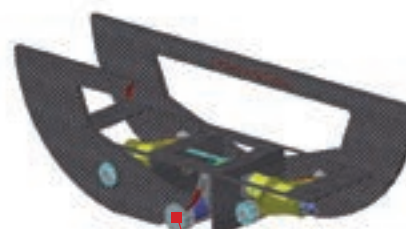
1

Mounting jig



2

*Bulkheads and keel
structure*



3

*Keel rams, bearings and
keel bearings*

Here above you can see how the shipyard made the structural part of the canting keel system.

- 1) The JIG is placed between the two main bulkheads and glued on the hull.
- 2) JIG is removed and longitudinal plates and floor are placed between the bulkheads
- 3) The canting keel system (rams, bearings and accessories) are placed on board

THE BIGGEST CANTING KEEL IN THE WORLD...

140' MARI-CHA IV is composed by a double acting cylinder with a bore of 380mm and a stroke of 1280mm (358 tons working load).

The particular shape of the boat bulkheads needs a special asymmetrical bearing to be machined.

Cariboni cares a lot about reliability of its system. That is proved by the long sailed before the first service, made after 25000NM.



140' MARI-CHA IV

...AND THE FASTEST

Only 6.5 seconds from -55° to +55°!

This is the outstanding performance of the Cariboni's canting keel system developed for the 90' "Genuine Risk".

The keel control is made by two double acting cylinders feed by PTO diesel engine pumps, with an extraordinary 55° canting keel angle.

The PLC system controls the performance of the boat in order to achieve performance, reliability and easy handling of the boat even with this huge amount of power. ACC manual control and deck equipment complete the hydraulic system of this milestone boat.



Genuine risk

VOLVO CANTING KEEL SYSTEMS

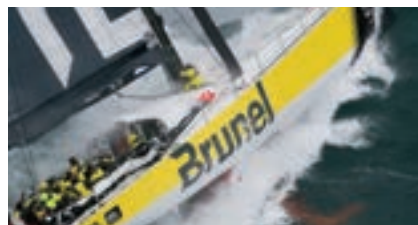
VOLVO OCEAN RACE 2017 - 2018



Dongfeng Race Team
Winner



Mapfre



Team Brunel

VOLVO OCEAN RACE 2014 - 2015



Abu Dhabi Ocean Racing
Winner



Team Brunel



Dongfeng Race Team

VOLVO OCEAN RACE 2011 - 2012



Groupama Sailing Team
Winner



Team Telefonica



**PUMA Ocean Racing by
BERG**



Abu Dhabi Ocean Racing

VOLVO OCEAN RACE 2008 - 2009



Ericsson E4
Winner



Puma "Il Mostro"

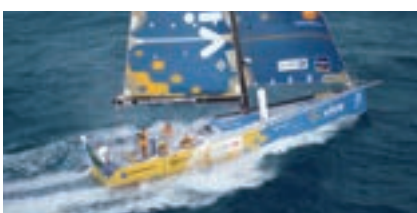


Ericsson E3

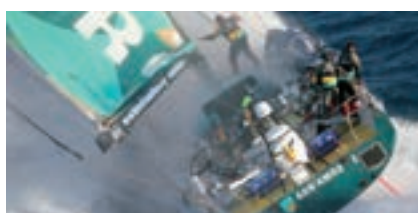
VOLVO OCEAN RACE 2005 - 2006



ABN AMRO ONE
Winner



BRASIL 1



ABN AMRO TWO

CANTING & LIFTING KEEL SYSTEMS

The canting and lifting keel system is composed by canting keel cylinders, a box which contains the fin, twin screws and a Magic Trim or a lifting cylinder.

Safety: the canting system can operate in emergency with only one cylinder.

The screws keep the keel in lifted position in case of lifting mechanism failure. They allow to lower the keel in sailing position.

A CNC machined jig of the structure is supplied for the correct alignment of the bulkheads and for an easy installation on the boat of the keel mechanism.



MAIN FEATURES for 69' cruiser/racer:

Max Canting Angle: 38°
Bulb weight: 5100 kg
Fin weight: 1550 kg
Lifting stroke: 1770 mm

The cylinders move the box that contains the fin; when the box is in central position, the lifting mechanism can be activated. The twin screws guarantee the alignment of the system, while the lifting mechanism bears most of the keel weight.

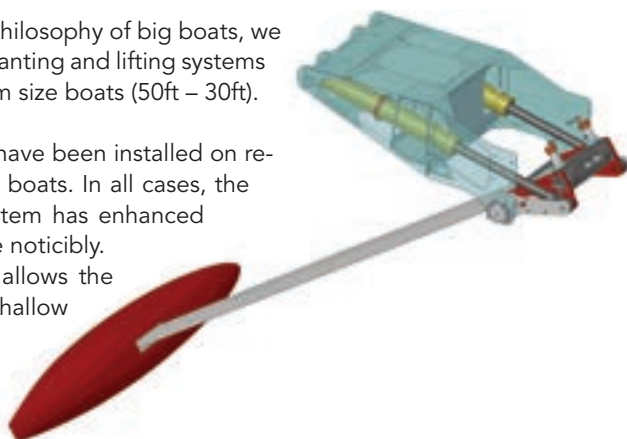


MAIN FEATURES for a 115' racer:

Max canting angle: 35°
Bulb weight: 11000 kg
Fin weight: 400 kg
Distance Bulb CG – Axis: 5200 mm
Distance Fin CG – Axis: 2000 mm
Lifting stroke : 1770 mm
Dimensions: 1150x2700x3020 mm
Weight: 1500 kg

With the same philosophy of big boats, we developed the canting and lifting systems for small-medium size boats (50ft – 30ft).

Similar systems have been installed on regatta and cruise boats. In all cases, the canting keel system has enhanced the performance noticeably. The lifting keel allows the boat to access shallow waters.



Main characteristics:

- Keel is CNC milled; leading/trailing edges are also possible in lighter material..
- Canting angle from 40° to 55°.
- Canting cylinders made of 17-4-PH.
- Optional frame for transferring loads to bulkheads.
- Manual or Magic Trim lifting.
- PLC driven automated keel control.



CRUISER AND CRUISER-RACER KEEL SYSTEMS

The largest experience in canting, lifting and canting&lifting keel system in the world.
Cruiser and cruiser-racer: alluminium and stainless steel for top reliability and lightweight.

YACHT	SIZE ft	MAIN SYSTEMS*	YEAR
AS70	70	Canting & Lifting keel, keel, hydraulic system, sailing cylinders	W.I.P.
MCE	100	Canting keel, keel, hydraulic system, sailing cylinders	W.I.P.
MD78	78	Lifting keel, keel, hydraulic system, sailing cylinders	W.I.P.
MILLS 41	41	Lifting keel, fin, hydraulic system, sailing cylinders	2023
ICE YACHTS - ICE 70 - 4	70	Lifting keel, hydraulic system, sailing cylinders	2023
ICE YACHTS - ICE 70 - 3	70	Lifting keel, hydraulic system, sailing cylinders	2023
KNIERIM 62	62	Lifting keel, fin, hydraulic system, sailing cylinders	2023
PERSICO MARINE - CS 80	80	Canting keel, hydraulic system, sailing cylinders	2022
ICE YACHTS - ICE 70 - 2	70	Lifting keel, hydraulic system, sailing cylinders	2022
ICE YACHTS - ICE 60 TARGA	60	Lifting keel, hydraulic system, sailing cylinders	2022
MD TECHNOLOGIES - 62 - 2	62	Lifting keel, fin, hydraulic system, sailing cylinders	2022
NEO YACHTS & COMPOSITES - NEO 570	57	Lifting keel, hydraulic system, sailing cylinders	2022
ICE YACHTS - ICE 70	70	Lifting keel, hydraulic system, sailing cylinders	2021
NEO YACHTS & COMPOSITES - NEO 430 - 3	43	Lifting keel, fin, hydraulic system	2020
NEO YACHTS & COMPOSITES - NEO 430	43	Lifting keel, fin, hydraulic system	2020
SOUTHERN WIND	96-3	Lifting keel, fin, hydraulic system, sailing cylinders	2020
MYLIUS - CK 60	60	Canting keel, fin, hydraulic system, sailing cylinders	2019
MAXI DOLPHIN	73	Lifting keel, fin, hydraulic system, sailing cylinders	2019
PERSICO MARINE - FY 65	65	Lifting keel (1550 mm), hydraulic system, sailing cylinders	2019
ADRIA SAIL - HARRY 65	65	Lifting keel, fin, hydraulic system, sailing cylinders	2019
NACIRA	69	Canting & Lifting keel, fin, hydraulic system, sailing cylinders	2019
MAXI DOLPHIN	73	Lifting keel, fin, hydraulic system, sailing cylinders	2018
FY 65 - PERSICO MARINE	65	Lifting keel (1550 mm), hydraulic system, sailing cylinders	2018
SOUTHERN WIND	96-2	Lifting keel, fin, hydraulic system, sailing cylinders	2018
SOTO 77	77	Lifting keel, fin, hydraulic system, sailing cylinders	2017
SOUTHERN WIND	96-1	Lifting keel, fin, hydraulic system, sailing cylinders	2017
BOTIN 70	70	Lifting keel, fin, hydraulic system, sailing cylinders	2017
PREMIER COMPOSITE JV74	74	Lifting keel, fin, lifting cylinders, locking cylinders	2017
SALONA 67	67	Lifting keel, fin, hydraulic system, sailing cylinders	2017
KING MARINE 65	65	Lifting keel, fin, hydraulic system, sailing cylinders	2015
CONRAD YCC 91	91	Lifting keel, fin, sailing cylinders	2014
KNIERIM 60	60	Lifting keel, fin, hydraulic system, sailing cylinders	2014

* Where not indicated the fin has not been supplied by Cariboni

CRUISER AND CRUISER-RACER KEEL SYSTEMS

YACHT	SIZE ft	MAIN SYSTEMS*	YEAR
KNIERIM 65	65	Lifting keel (1800 mm), fin, hydraulic system, sailing cylinders	2013
SOTO 65	65	Canting keel, hydraulic system, sailing cylinder	2013
ICE 62	62	Lifting keel (1550 mm), hydraulic system	2013
DINAMICA	31	Lifting keel (up to 540 mm)	2012
BB	36	Pivoting keel, fin, hydraulic system	2011
KNIERIM 57 - OPAL	57	Canting keel (one cylinder, 45°), fin, hydraulic system, cylinders	2011
DREAM 67	67	Canting keel (one cylinder, 40°), fin and bulb, hydraulic system, cylinders	2011
COMET 100	100	Lifting keel (2200 mm), keel, fin, locking pins, hydraulic system, furler, cylinders	2011
RO620	62	Fin and bulb	2011
CONRAD	66	Pivoting keel, locking pins, hydraulic system, transom door, cylinders	2009
AD 54	54	Canting keel (one cylinder, 40°), MagicTrims, cylinders, hydraulic system	2009
SHIPMAN	80	Lifting keel (1430 mm), locking pins, transom door	2009
ESTE CLASS 40	40	Lifting keel (1500 mm), fin, hydraulic system, keel, head	2008
SHIPMAN 72	72	Lifting keel cylinder (1430 mm), locking cylinders, transom door cylinders	2008
SHIPMAN 63	63	Lifting keel cylinder (1430 mm), locking cylinders, transom door cylinders	2008
FINOT – OURSON RAPIDE	60	Lifting keel (1500 mm), special cylinder for locking system, hydraulic system, mainsheet MagicTrim with auto-tacking system, anchor stowing, jib furler, turning mast cylinder.	2008
SEAWAY 60	60	Lifting keel (1350 mm) and fin	2006
TONY CASTRO 60	60	Lifting keel (1250 mm), easy Sailing hydraulic system with Magic Trim, hydraulic propulsion, jib furler, cylinders	2006
FY 61	61	Lifting keel (2000 mm), hydraulic system	2006
KANAP-ONE	86	Lifting keel (2000 mm), hydraulic system, transom door, furlers, manual control system, cylinders, MDA	2005
SHAKA	80	Canting keel (40°, 2 cylinders), easy sailing hydraulic system with Magic Trim, canard, manual control system, furler, cylinders, MDA	2005
BLUSAIL 54	54	Lifting keel (2000 mm), hydraulic system, jib furler, cylinders, MDA	2004
RANDONNEUR 42	42	Lifting keel (900 mm), hydraulic system	2004
FINOT 40	40	Magic Trim for lifting keel (1360 mm), special cylinders for locking keel, manual control system	2003
FETCH IV	79	Lifting keel (1160 mm), hydraulic system, manual control system, cylinders, MDA	2003
DANGEROUS BUT FUN	80	Canting keel (40°, 2 cylinders), easy sailing hydraulic system with Magic Trim, canard, manual control system, furlers, cylinders	2003
MAGNITUDE 80	80	Canting keel (50°, 2 cylinders), hydraulic system, manual control system, cylinders, pedestal pump	2003

* Where not indicated the fin has not been supplied by Cariboni



CRUISER AND CRUISER-RACER KEEL SYSTEMS

YACHT	SIZE ft	MAIN SYSTEMS*	YEAR
KAURIS III	105	Canting keel , (40°, 2 cylinders), easy sailing hydraulic system with Magic Trim and automatic tacking for jib, keel and canard, canards, furlers, manual control system, cylinders, MDA	2002
AORI	80	Canting keel (40°, 2 cylinders), easy sailing hydraulic system with Magic Trim, canard, manual control system, furlers, cylinders	2002
ADP FINOT 52	52	Magic Trim for lifting keel (1600 mm), Magic Trim for main sheet	2001
ANYWAY	64	Canting keel (40°, 2 cylinders), hydraulic system,	2001
KRATOS	60	Canting keel (40°, 2 cylinders), hydraulic system, canard	2001
ONLY NOW	104	Canting keel (40°, 2 cylinders)	2001
TIKETITOO	88	Canting keel (40°, 2 cylinders), easy sailing hydraulic system with Magic Trim, canard, furlers, cylinders	2001
V .S. MARA	88	Lifting keel (1900 mm), complete hydraulic system, cylinders, manual valves and pump	2001
JULIA	43	Canting & lifting keel (40°, 2 cylinders), hydraulic system	2000
TOMTIT	55	Lifting keel (1105 mm), easy sailing hydraulic system, with Magic Trim and automatic jib tacking, cylinders	2000
CARRERA (Wally 77.4)	77	Lifting keel (1520 mm), easy sailing hydraulic system with Magic Trim, cylinders	1999
SHINING	65	Magic Trim for lifting keel (2250 mm), hydraulic system, cylinders	1999
TIKETITAN	88	Canting keel (40°, 2 cylinders), easy sailing hydraulic system with Magic Trim, canard, furlers, cylinders	1998
JUNOPLANO	60	Canting keel (55°, 1 cylinder)	1997

* Where not indicated the fin has not been supplied by Cariboni





RACER KEEL SYSTEMS

Racer yacht: titanium and 17-4-PH cylinders for top performances and reliability.

YACHT	SIZE ft	MAIN SYSTEMS*	YEAR
NAUTOR CS 80	80	Canting keel, keel, hydraulic system, sailing cylinders	2022
FELCI 33	33	Canting keel, hydraulic system	2021
NAUTOR - CS 125	125	Canting keel, hydraulic system, sailing cylinders	2021
MELGES 40	40	Canting keel, hydraulic system - ONE DESIGN	2017
INFINITI 46	46	Canting keel, hydraulic system, sailing cylinders, fin	2015
KNIERIM KER 56	56	Canting keel, hydraulic system, sailing cylinders	2015
NEW 3 - COMANCHE	100	Canting keel, hydraulic system, sailing cylinders	2014
NANDOR FA	IMOCA 60	Canting keel, hydraulic system	2014
VOR 65	65	Canting keel, hydraulic system - ONE DESIGN	2013
FARR 11 S	34	Canting keel, sailing cylinders	2013
BRENTA 33 SUPERSTAR	33	Canting keel, fin, hydraulic system, sailing cylinders	2012
ABU DHABI	VOR 70	Canting keel, hydraulic system	2011
PUMA	VOR 70	Canting keel, hydraulic system	2011
TELEFONICA	VOR 70	Canting keel, hydraulic deck equipment	2011
GROUPAMA	VOR 70	Canting keel, hydraulic system, sailing cylinders	2011
STRAVAGANZA	42	Canting keel, fin, hydraulic system, sailing cylinders	2011
CHEMINEES POUJOULAT	IMOCA 60	Canting keel, deck equipment, manual hydraulic system	2011
HUGO BOSS	IMOCA 60	Canting keel refitting (ex Pindar), manual hydraulic system	2011
GP42	42	Keel fin and bulb	2009
VIRBAC	IMOCA 60	Canting keel cylinders	2009
PRB	IMOCA 60	Canting keel cylinders	2009
LUNA ROSSA	STP 65	Lifting keel, deck equipment	2008
TH 38	38	Canting keel, canting dagger board, hydraulic system	2008
PUMA	VOR 70	Canting keel, hydraulic system	2008
ERICSSON 3	VOR 70	Canting keel, hydraulic system	2008
ERICSSON 4	VOR 70	Canting keel, hydraulic system	2008
SAFRAN	IMOCA 60	Canting keel, hydraulic system	2007
BEL	IMOCA 60	Canting keel, hydraulic system	2007
AVIVA	IMOCA 60	Canting keel cylinders	2007
ECOUVER	IMOCA 60	Canting keel cylinders	2007
PINDAR	IMOCA 60	Canting keel, hydraulic system, special cylinders and components	2007
WILD LADY (Wilke)	49	Canting & lifting keel, fin, hydraulic system	2007-6
DELTA DORE	IMOCA 60	Canting keel cylinders	2006
ABN AMRO ONE	VOR 70	Canting keel, hydraulic system, manual control system, cylinders	2005
BRASIL 1	VOR 70	Canting keel, hydraulic system, manual control system, cylinders	2005
ABN AMRO TWO	VOR 70	Canting keel, hydraulic system, manual control system, cylinders	2005
MAIDEN	115	Canting & lifting keel, hydraulic system, , manual control system, special cylinders, water ballast system, front rudder	2003
MARI-CHA IV	140	Canting keel	2003
GENUINE RISK	90	Canting keel, hydraulic system, hydraulic propulsion, manual control system, cylinders, front rudder for CBTF, MDA	2003
WIND	OPEN 50	Canting keel	1999
FILA	OPEN 60	Canting keel, hydraulic system, special components	1997

* Where not indicated the fin has not been supplied by Cariboni

FOILING SYSTEM



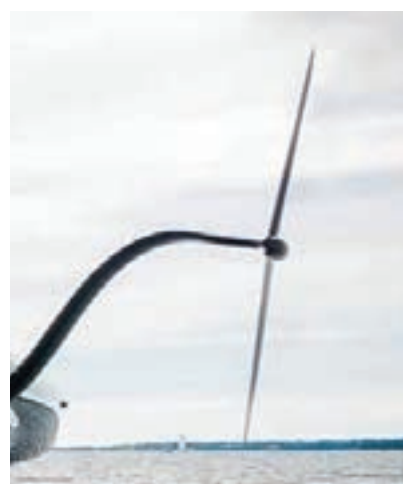
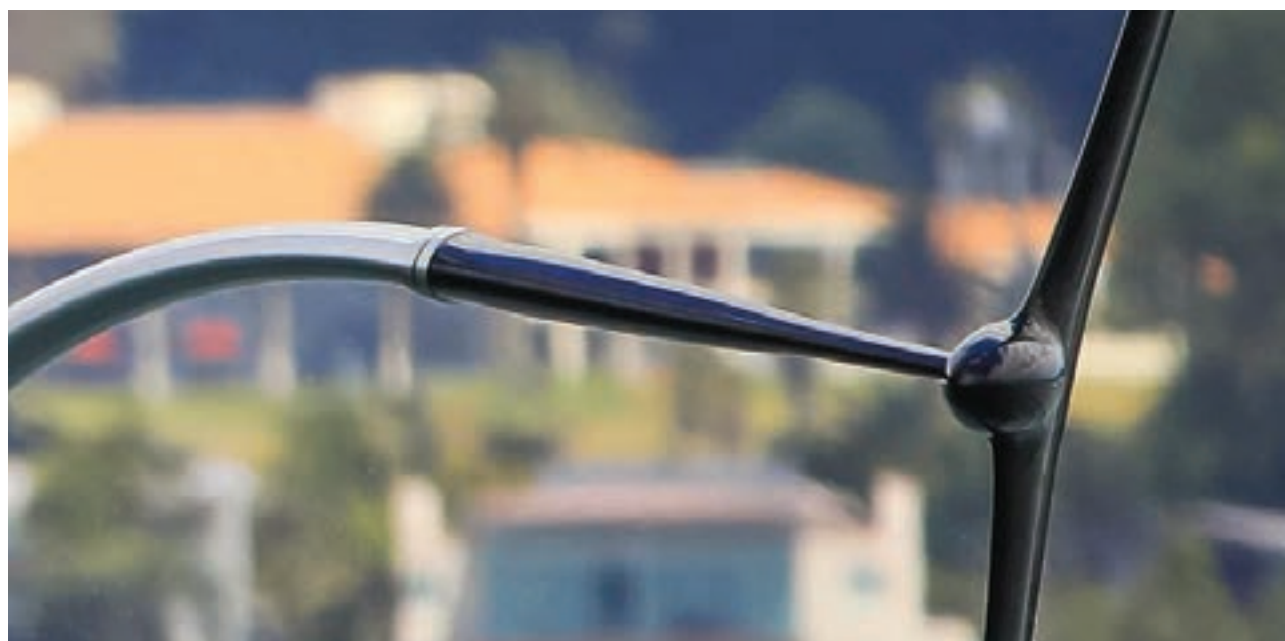
A different way of sailing, "Flying on foils". We have developed and produced different systems based on the boat specific needs. Mainly applied on racing boats, it could be also implemented on fast cruising ones. For boats from 25 foot up to..no limits!



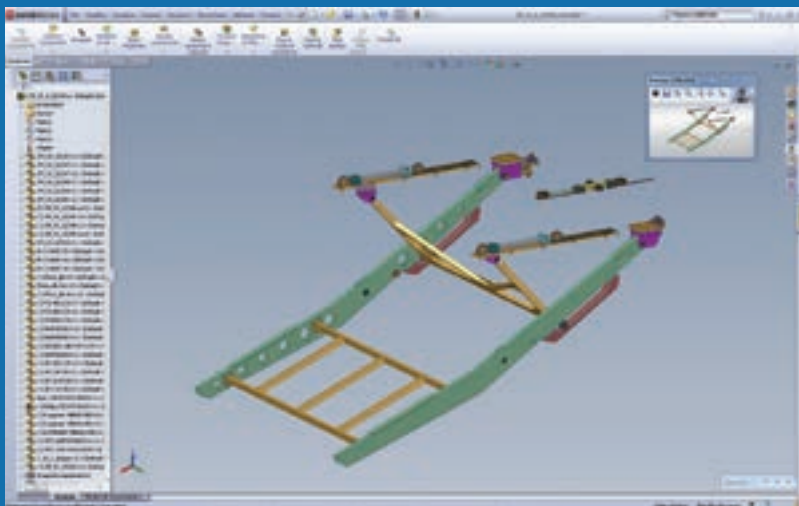


FOILING SYSTEMS

YACHT	SIZE ft	MAIN SYSTEMS	YEAR
JK RTW	80	Foil control, hydraulic system, sailing cylinders	WIP
BGH - HSV	45	Foil, foil control, propulsion system	WIP
AC75	75	Foil control cylinders, sailing cylinders	WIP
LEQ12	40	Foil control, hydraulic system, sailing cylinders	2023
AC40	40	Foil control cylinders, sailing cylinders	2023
BALTIC 111	111	Canting Foil cylinders	2023
FLYING NIKKA	60	Foil control, hydraulic system, sailing cylinders	2021
KM 45	45	Foils and flaps, foil control, hydraulic system, sailing cylinders	2021
AC 75	75	Foil control, sailing cylinders	2021
TNZ 40	40	Foil control, hydraulic system, sailing cylinders	2019
LR 7.5	25	Foil control, hydraulic system, sailing cylinders	2019
AM 38	38	Foil control, hydraulic system, sailing cylinders	2018



SPECIAL PRODUCTS



The story of Cariboni counts many special systems designed for its customers. From small systems for deck equipment up to the automatic platforms for dinghy of large catamarans, we're always ready to fulfill the dreams of our customers.



*A custom arrangement to manually lift
the propeller shaft.
The system weights only 2,4 kg!*



ANCHOR STOWING

Cariboni knows the importance of lightness on marine equipment. They have been developed, for cruising yachts, various lightweight anchor stowing motors.

It is a simply and clever idea: helicoidal screw, driven by an hydraulic engine, acts on a gearbox to move the anchor arm in and out on the bow. The models are designed according to the maximum torque moment.

The body is made of lightweight hard coated aluminium, gears are made of 17-4-PH stainless steel and bronze. The high torque hydraulic engine has a waterproof cover in order to protect it from marine corrosion.

In case of need to turn around the headstay, an additional feature can be added on the motor.



Anchor stowing motor

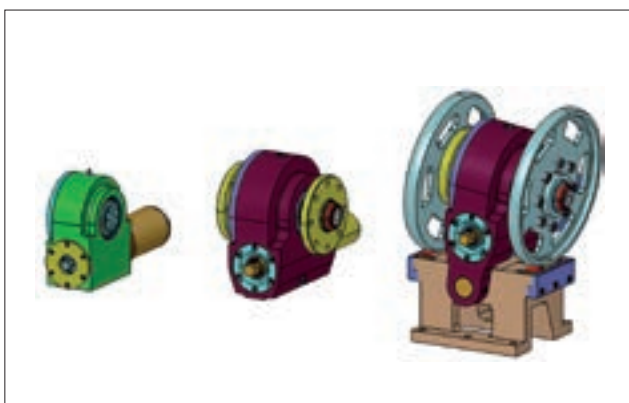
MODEL	Maximum moment	Dimensions		Weight		Working pressure		Flow required ⁽¹⁾
	Nm	mm	in	kg	lb	bar	psi	lpm
AAS 800	800	350 x 220 x 206	13,8 x 8,7 x 8,1	16	35,3	140	2000	3
AAS 1300	1300	377 x 260 x 246	14,8 x 10,2 x 9,7	25	55,1	140	2000	3
AAS 3000	3000	528 x 338 x 308	20,8 x 13,3 x 12,1	49	108	165	2400	5

(1) Min flow required for maximum torque; lower flow reduces max torque available

(2) To define maximum anchor weight use following formulas

Max anchor weight = maximum moment / (anchor arm in mm x 9,81)

Max anchor weight lb = max anchor weight kg x 2,205



From left to right: AAS 800, AAS 1300 and AAS 3000

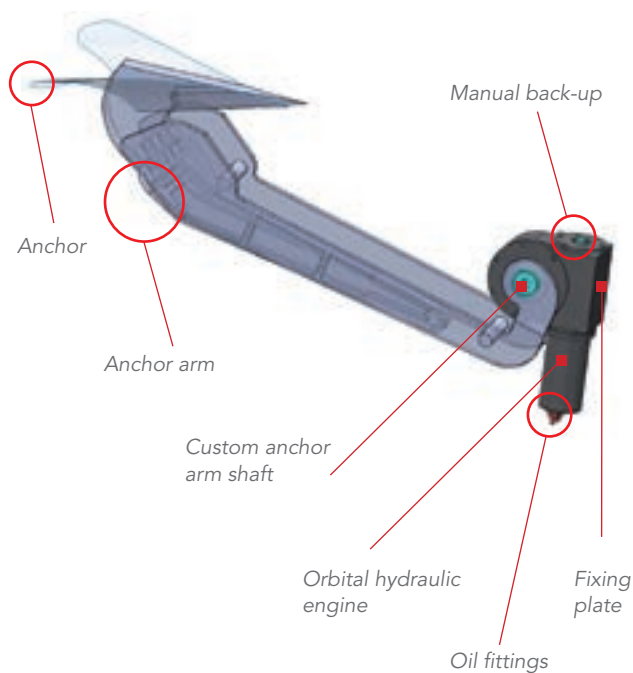


AAS 800

ANCHOR STOWING SYSTEM KIT



AAS 800 fitted powerboat



Cariboni supplies a complete pack for anchor stowing based on its AAS models. This kit is made with a compact lightweight powerpack, an ASS model depending on the anchor weight, a double acting cylinder and the compact electric control box.



1



2



3



4

- 1 - Compact powerpack, with valves and integrated oil reservoir.
- 2 - PLC system to control the powerpack and limit switches to self controlled the system.
- 3 - CL16 double acting cylinder to open/close the hatch anchor
- 4 - AAS_800 hydraulic anchor stowing system

RETRACTABLE TABLE

The retractable table has a telescopic hydraulic cylinder. It is required a minimum of space, but it guarantees an high stability in the open position.



TAV_MOB_04478

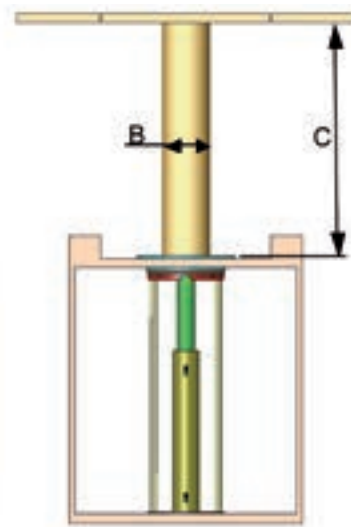
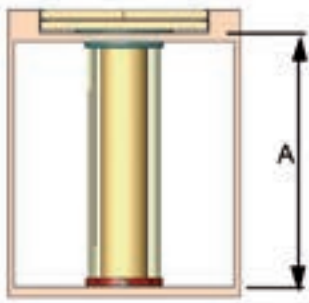
A 790 mm

B 80 mm

C 720 mm

Black hard coated aluminium.

Custom models available



Two retractable tables fitted on the Tony Castro 60' "Sizzler".

With this solution you have a flat deck for sailing time and a full comfortable and large table at rest just pushing a button.



THRUSTER AND HYDRAULIC ROTATING PROPULSION

Cariboni designed for Wally a new manoeuvring and emergency system for large cruising yachts based on the use of two thrusters that operate both for propulsion in case of emergency and for manoeuvring. This system has been featured for the first time by Wally 105' "Nariida".

Retractable and tunnel bow/stern thrusters are available for every size of boat.



Nariida in action



The rotating propulsion

LIFTING PROPULSION

LIFTING PROPULSION

- Light weight (11 kg in titanium version)
- Material: titanium or 17-4 PH
- Homokinetic joint
- Manual lifting system
- Engine power up to 110 hp
- Custom flange to adapt the system to any engine



HYDRAULIC LIFTING PROPULSION

- Light weight (33 kg in titanium version)
- Material: titanium or 17-4 PH
- Hydraulic engine directly connected to the shaft
- Titanium and NITRONIC 50 shaft
- Hydraulic lifting system
- Engine power up to 350 hp

HYDRAULIC LIFTING PROPULSION

- Material: titanium and aluminium
- Hydraulic engine directly connected to the shaft
- INCONEL shaft
- Hydraulic lifting system
- Engine power up to 350 hp



Alegre - Lifting propulsion



Comanche – Hydraulic lifting propulsion

OTHER SPECIAL PRODUCTS...

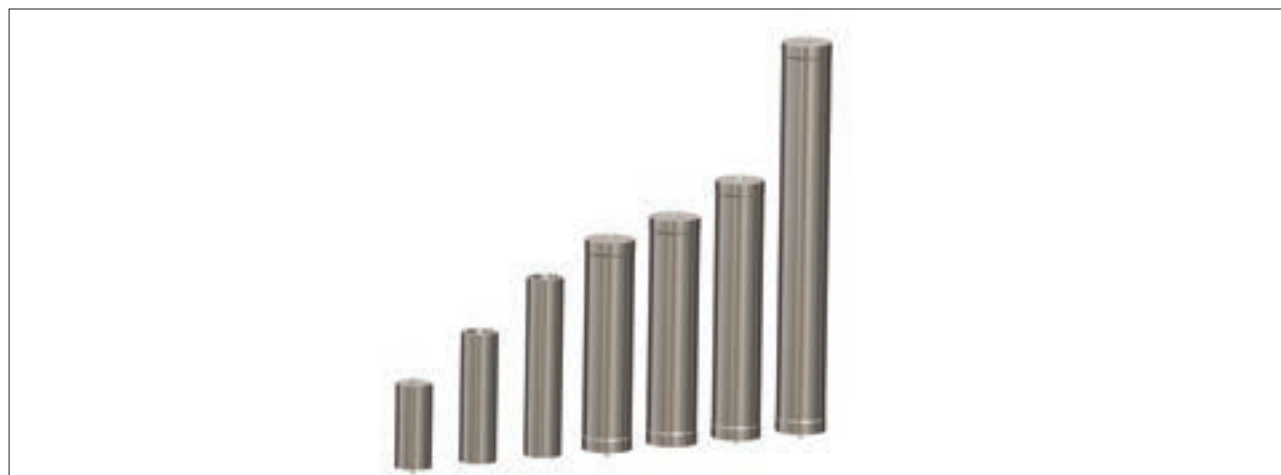
CUSTOM SERVICE UNITS FOR PTO GENERATORS OR DIESEL ENGINE

Cariboni designs and machinery custom PTO arrangements with clutch, rubber joint and hydraulic pump. Small dimensions, reliability and lightweight are guarantee.



PISTON ACCUMULATORS

Accumulator	Volume	Max pressure	Dimensions	Weight
	<i>L</i>	<i>bar</i>	<i>mm</i>	<i>kg</i>
ACC A 075	0.75	350	Ø98 x 228	4,3
ACC A 125	1.25	600	Ø99 x 351	5,9
ACC A 200	2	600	Ø99 x 483	6,9
ACC A 450	4,5	350	Ø134 x 571	10,3
ACC A 500	5	350	Ø136 x 615	11,9
ACC A 600	6	350	Ø132 x 698	10,5
ACC A 1000	10	350	Ø134 x 1057	15,6





OTHER SPECIAL PRODUCTS...

JAMMER



Jammer	Max Load Kg	Max pressure bar	Rope Diameter mm	Dimensions mm	Deck thickness mm	Weight kg
JWM 014	3500	500	14	57 x 67 x 180	45 - 48	2,3

CUSTOM TRANSOM DOOR SYSTEMS



LIGHTWEIGHT ALUMINIUM CAPTIVE WINCH



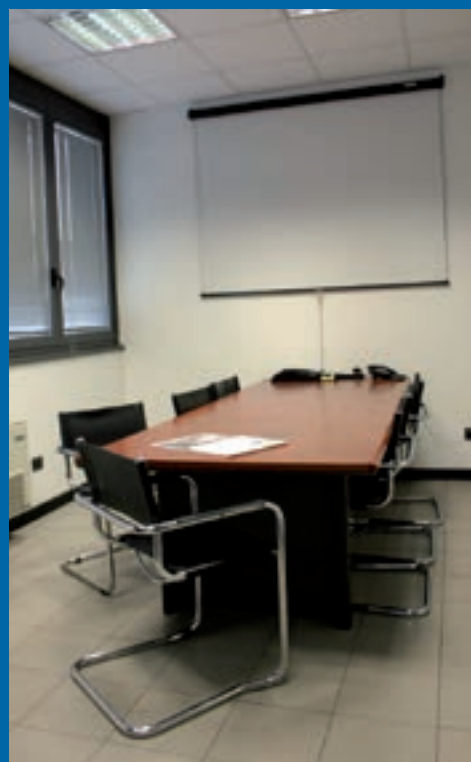
HEAT EXCHANGER WITH TITANIUM PLATES



DESIGN & CNC



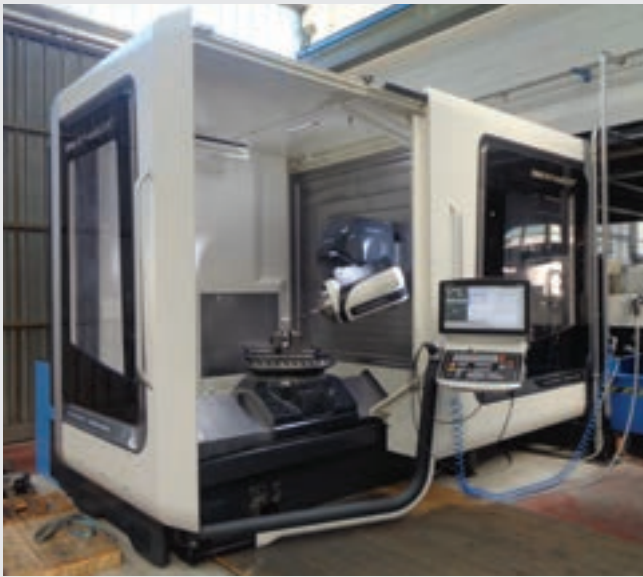
Design office



*Cariboni's meeting room
You are always welcome!*



Emco Maxx Turn 110 – CNC lathe and milling machine, 4 axis. It is equipped with motorised tools, integrated mandrel motor and Y axis. Max Ø: 560mm. Max length: 3520mm.

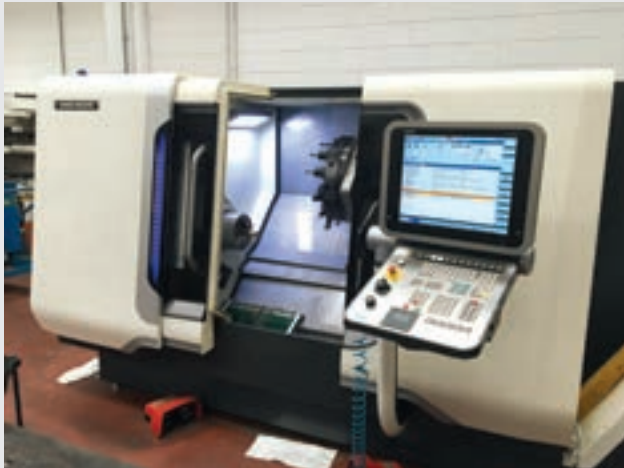


DMU 90 P duoBLOCK – Five axis simultaneous machining with 900mm X-axis, 1050mm Y-axis, 850 z-axis. 15.000rpm speedMASTER spindle and a tool magazine with 60 positions.

DMU 75 - Five-axis simultaneous machining with 750mm X-axis traverse (75:750mm), 20.000 rpm speedMASTER spindle and a tool magazine with 60 positions.



GF Machining Solutions CUT E 600 – With 600 X-axis, 400 Y-axis, 350 Z-axis, wire 0,25mm max taper angle 30°/56mm



DMG Mori - CTX Beta 800 - CNC lathe and milling machine, 4 axis. It is equipped with motorised tools, integrated mandrel motor and Y axis.



DMG Mori - CTX Alpha 500 - CNC lathe and milling machine, 4 axis. It is equipped with motorised tools, integrated mandrel motor and Y axis. It enables also off-centre turning and milling.



Shark milling machine
Pieces are up to
x 2500 y 1050 z 1200 mm
of dimension.



CNC grinding machine
is used to machine the cylinders rods



The "PBR" is the biggest lathe machine of the firm.
It can machine tubes up to 3500 mm length
with a diameter of 700mm.
Big Magic Trim tube, rods and big cylinders components
are made by this machine.



The "Tiger - TLM 4" CNC milling machine is the biggest machine of the firm. The birotating head works over a volume of 4000x1200x1500 mm and has a target power of more than 28 kW. Fins and bulbs are machined out here as the biggest parts for the custom arrangements.



The "Zanoletti" medium size 5 axes CNC lathe. Small and medium size cylinder parts are machined out here.



The "Mikron" small CNC milling machine is mainly used for the production of manual system components as pump, valves and other small parts. It is a 5 axes mill with a working space of 710x500x500 mm.



The "Die Sinking EDM" plunge electrical discharge machine which is used for special components and tools.



The "Momac" lathe machine is used to produce small-medium pieces up to 400 x 1000 mm. Pins, small cylinder pistons and parts of manual components are machined out here.



The "Tiger" CNC milling machine is one of the most reliable machine of the firm. The "Momac" lathe machine is used to produce small-medium pieces up to 400 x 1000 mm. Pins, small cylinder pistons and parts of manual components are machined out here



The 2 lathe machines are used to produce special tools for our products and for easy adjustments on the test components.



Grinding machine Delta compact plus X 1100 Y 600



The oven for the heat treatment of special parts (like bolts for the canting keel systems). It can warm up pieces up to 1100°C.



The chain sawing cuts every size of pieces (aluminum, steel and titanium).



The "Lappatrice" is our CNC lapping machine used for every type of cylinder or Magic Trim tubes. It can handle up to 4.5 meter of tube with an internal diameter of 400mm!



In the photo is shown one of our manual machines: a lapping machine used to polish and clean the pieces.



Assembly and testing area



Engine testing room



Bench test, with a length of 4200 mm, has been thought to test at 100% every size of Cariboni's ram.



*Kardex. Automatic warehouses.
Seals, parts and tested products are all stored here managed by a software.*



Paolo, Daniele, Fabrizio and Alessandro



Dino, Maurizio, Gianni and Marco



Andrea, Gianluca and Andrea



Dennis, Claudio, Pierluca and Marco



Giorgio, Matteo and Nello



Attilio, Simone and Lara



Ambrogio, Massimo, Alessandro, Matteo and Mirko



Gianni



Mary

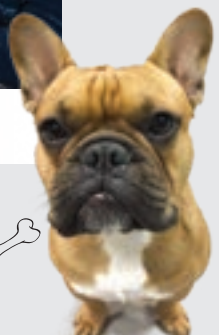


Paola



Marco

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