

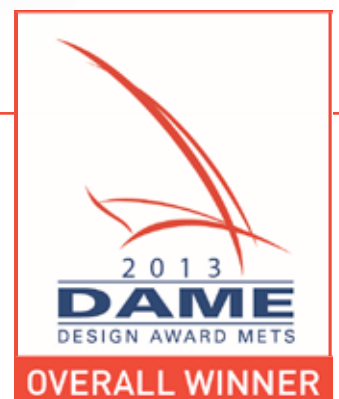


Verified Stabilizer Revolution!



"The elegantly curved fin better suits many of the modern hull forms to which stabilizers are becoming a standard fit!"

- Dame Award jury validation -





"It's quite a beautiful piece of engineering that will sit under the water and most people won't see!"

- Bill Dixon -

Jury Chairman, Dame Awards 2013

What can they do for me and why do I need them?

First of all, while most products available of various technologies and levels of efficiency are called stabilizers, the term itself is perhaps a little misleading. What they really do is reduce the roll movement of a vessel but not very much of the pitch, sway, yaw or heave movements you get on a vessel in waves. Luckily, in most situations, the roll is by far the more dominant and most uncomfortable motion, so reducing roll by a good percentage will make a huge difference in comfort and safety on board.

So, at least if it's a good system, stabilizers will reduce the roll of a boat and thereby increase comfort dramatically. But it's important to note that some systems are focussed more towards 'at anchor' situations and others towards more time spent 'cruising'.

But why should customers have to choose? By both increasing efficiency and reducing the negative side effects of the old style fin stabilizers, the revolutionary performance of our new Vector Fin stabilizers actually have both aspects covered, so now customers can say yes please to both, without any negative effects on their boat at all.

Do you need stabilizers? Well not being oxygen, food or water, then obviously not! But if you really enjoy boating then stabilizers are guaranteed to make you enjoy it even more. Not least for those with limited time available, they will find themselves enjoying boating much more on those precious few days when they do have the time to spare.

And need itself is a controversial word, because some people might say that you actually do need stabilizers. People like a family member, perhaps, who has a tendency to feel a little unwell at sea, if not downright seasick at times. Or the yacht broker, perhaps, who in two years time, when you have decided to trade in your boat because you are moving up, needs your boat to have stabilizers fitted like the majority of new boats that are having them fitted as standard. That's when you kick yourself a little and think why didn't I have stabilizers fitted and reap the benefits myself.....!

No, you probably don't NEED stabilizers, but anybody who has ever owned a boat with stabilizers, will NEVER EVER have another without...!

"It is like riding on a Magic Carpet..."

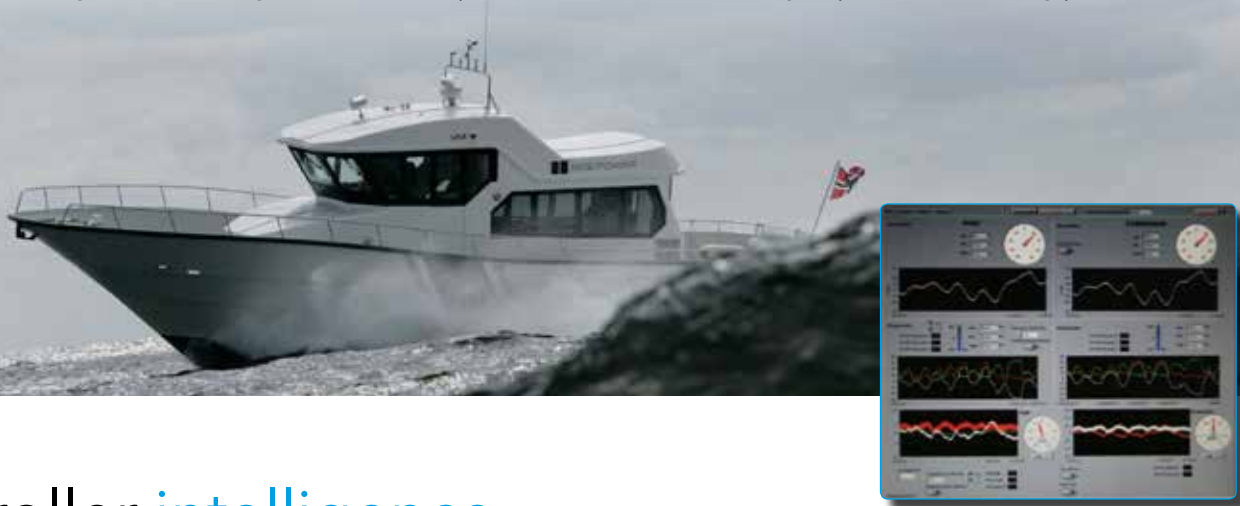
*- John Maxey -
Fairline 78 owner*

Research & Development

In our focus to develop the best products for the marine market, we continuously invest to make all our products even better, especially in going further in integrating systems as well as making systems for larger yachts and commercial applications.

To ensure the best possible quality in product development, we have built a dedicated 58 ft test vessel with a top speed of 37 knots. The boat functions as floating lab, fully loaded with advanced sensors and logging facilities for data collection and analysis.

During thousands of test hours, we have taken the time to learn about existing solutions and products to have the best possible background to design a even better product and to continuously improve our existing products.

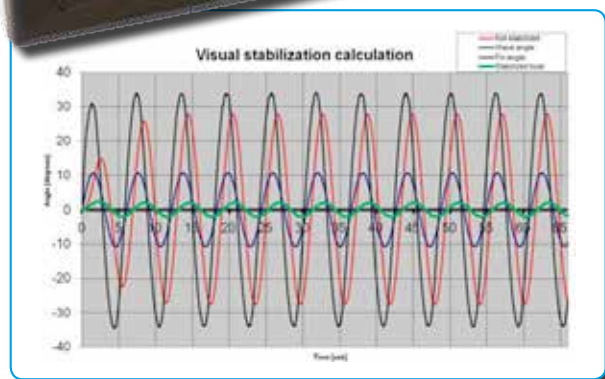


Controller intelligence

- an important difference between brands:



- State of the art electronic controller, utilizing the latest developments in the fast moving world of electronics.
- Color touch panel for easy use and control.
- Continuous development of the best control software possible, cooperating with leading companies in control technologies.
- Self adjusting - advanced algorithms - also "Any/No Speed" functions for stabilization at anchor.
- Easy upgrade of software ensures future compatibility and improvements.
- Reverse gear position input, but also other sensors to safeguard that fins are centred and locked immediately if the boat is starting to move backwards.
- GPS speed input (no shaft sensor) helps control algorithms do the best possible job.
- S-link integrated common intelligence with thruster systems and main hydraulics.



What do stabilizers do?

Stabilizer systems have been around for a long time, but typically only used on larger passenger ships and super yachts. However, the dramatically increased comfort and usability of any boat have, made owners of also smaller leisure vessels wish for this.

By reducing the uncomfortable rolling motion of the boat up to 95%, you get a lot of advantages:

- **Increased comfort on board**

- More use of the boat as you can go out in more weather conditions.
- People that easily get seasick can now enjoy boating.
- Less wear and tear of the boat as you do not have to always head into or away from larger waves to avoid the uncomfortable rolling motion.

- **Increased safety on board**

- Reduced risk of accidents caused by unexpected boat roll.







- **Less overall fuel consumption**

While adding fins (or other stabilizer types) basically will increase the fuel consumption a little at the same speed, our claim is that the overall fuel consumption will be reduced because:

- You can take the direct route to where you wish to go even in rough conditions.
- You can go at a more fuel efficient speed with the waves from the side while still being comfortable (modern cruisers have less roll at higher speeds, thereby people often drive them hard to avoid the rolling).



Key design features of Side-Power fin stabilizers:

-  Exceptionally low drag for fuel efficiency and use on high speed vessels
-  Compact installation measurements
-  Very quiet operation
-  Easy installation and set up procedures for the boat
-  Sturdy and reliable mechanical and hydraulic construction
-  Controller intelligence, the most important difference between brands

Introducing a revolutionary generation of fin stabilizers

Fin stabilizers is the only system that handle well both cruising and «at anchor» use, with the «at anchor» stabilization force deciding the size of the fins. Larger fins provide more stabilization force, but also create more drag which equals higher fuel consumption, especially at higher speeds, an important point for most boat owners. Larger fins also means that the internal components grow in size, making it difficult to install them in an optimal position which in turn can result in the stabilizers having negative side-effects like causing yaw (steering effects) and sway (side-way movements). Thereby, the overall situation often results in a compromise in fin size, so that most fast boats today do NOT have as much stabilization as most boat owners really want.



Vector fins™ - a simple solution

to a complex problem!

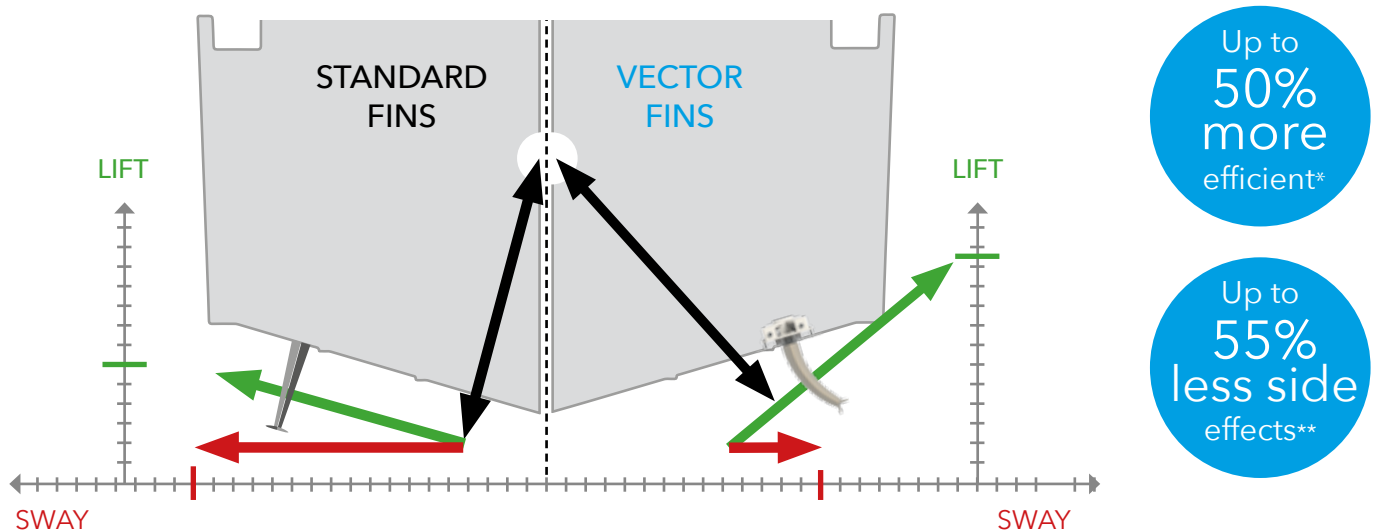
The vector fins™ stabilizers (Patent pending PCT/NO2013/050067) improve the roll reduction efficiency by some 50% in “at anchor” and 30% in cruising situations, while at the same time reducing undesired yaw and sway motions caused by active fins dramatically.

The huge benefits both in efficiency and reduced side-effects makes them particularly ideal for today's modern, fast cruisers where normal fin stabilizers have typically not been able to satisfy the desired roll reduction without causing too much side-effects. This is particularly true for light-weight cruisers below 20 meters, which also due to their shorter roll time periods are particularly difficult to stabilize, especially in the for stabilization light-weight come out for boats between 15 and 22 meters, as their unique advantages is really what will allow fins to be the perfect solution also for smaller, fast boats, where there is no good overall solutions today for both cruising and at anchor stabilization due to their light weight and shorter roll time.



How can Vector fins™ be so much better?

Vector fins™ simply re-direct the force direction/force vectors to a direction where more of the force will benefit roll reduction and less will be spent on the negative side-effects of yaw and sway that hurt the boat's handling and comfort. The vertical concave shape of the fin, makes the net force directions, both in cruising and in at anchor situations to be re-directed so that they work more "up/down" instead of just parallel to the hull angle. But there is more, by changing the net force angle, this also increases the leverage arm around the boat's rolling point, further enhancing the roll reduction force benefits. This provides a lot more roll stabilization per fin size, which means that drag, power consumption, internal space occupation as well as load on the mechanical parts is a lot less than with other fins that can give a similar roll reduction.



Verified test results - Princess 56 with 0,6m2 vector fins:

	No stabilizer	Vector fins	Reduction of:	
			Roll	Seasickness
Cruising at 11 knots:				
Max roll movement	10,4°	0,3°	97%	99,8%
Average roll movement	5,7°	0,15°	97%	99,9%
At anchor:				
Max roll angle	9,4°	2,6°	72%	92%
Average roll angle	4,1°	1,4°	66%	88%



Vector fins™ features:



- Up to 50% more efficient*
- Up to 55% less side effects**
- Fin design achieved with advanced hydrodynamic software.
- 20% - 50% less resistance than other fins.
- All fins are prepared for "Any Speed" function - 2:1 size ratio.
- The fins are made in "one shot" in vacuum injected vinylester over pre-shaped core material - with specially designed rowing and math layers. Most others are made in two halves and glued together.

*) 20-30% in cruising/40-50% at anchor with same size, same inside space requirements and same power consumption.

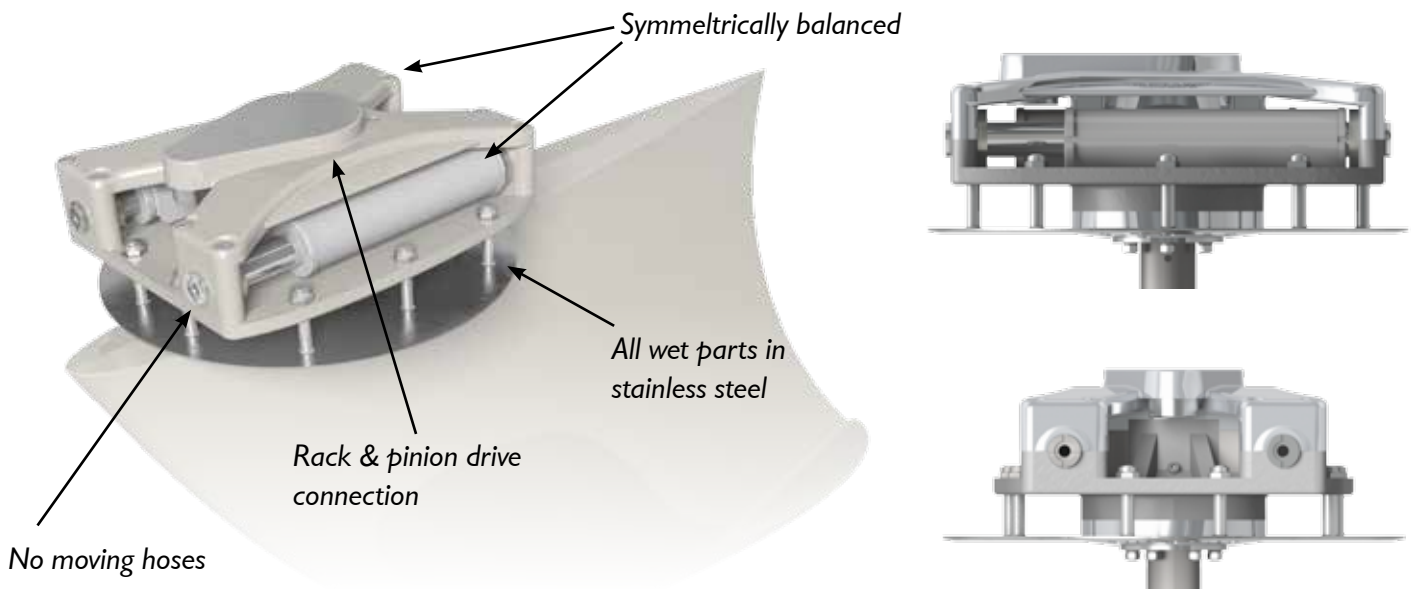
**) 30-35% in cruising/45-55% at anchor with the same stabilization force and same power consumption.

SPS55 Actuator

- the most compact fin stabilizer actuator ever!

The new SPS55 actuators for the [vector fins™](#) are incredibly compact and silent, designed to fit in the small available spaces in modern boats below 20m/70ft where living space is strongly prioritized.

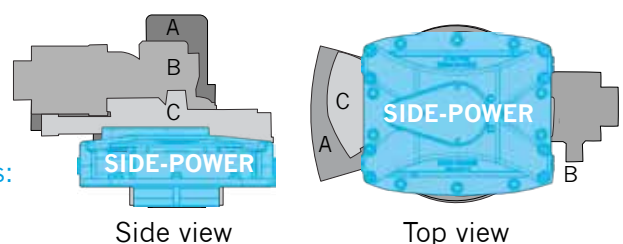
The SPS55 actuators have been designed to satisfy the needs of owner operated vessels with a total focus on reliability and hassle free operation, as well as ensuring a quiet operation as they will mostly be installed below the floor in living spaces.



Technical design benefits:

- Squared base plate provides large load distribution area to hull while still being possible to install in tight areas between stringers and bulkheads.
- Dual, balanced cylinders provide symmetrical load and force.
- The actuator can be installed in any direction in the boat, the fin angle is totally independent of actuator direction.
- No moving hoses at all secures against leakages and potential wear, as well as making the installation easier.
- Oversized bearings for lifetime operation with only a minimal level of maintenance.
- Rack & pinion drive connection for quiet, reliable, long life operation, with very easy service when needed after thousands of operational hours.
- Fins are installed and removed very easy and quickly from the outside for best convenience in for example transport or other haul-out situations where this might be needed.
- Defined shaft-shear point in case of the fins accidentally hitting something.
- All wet parts in stainless steel.

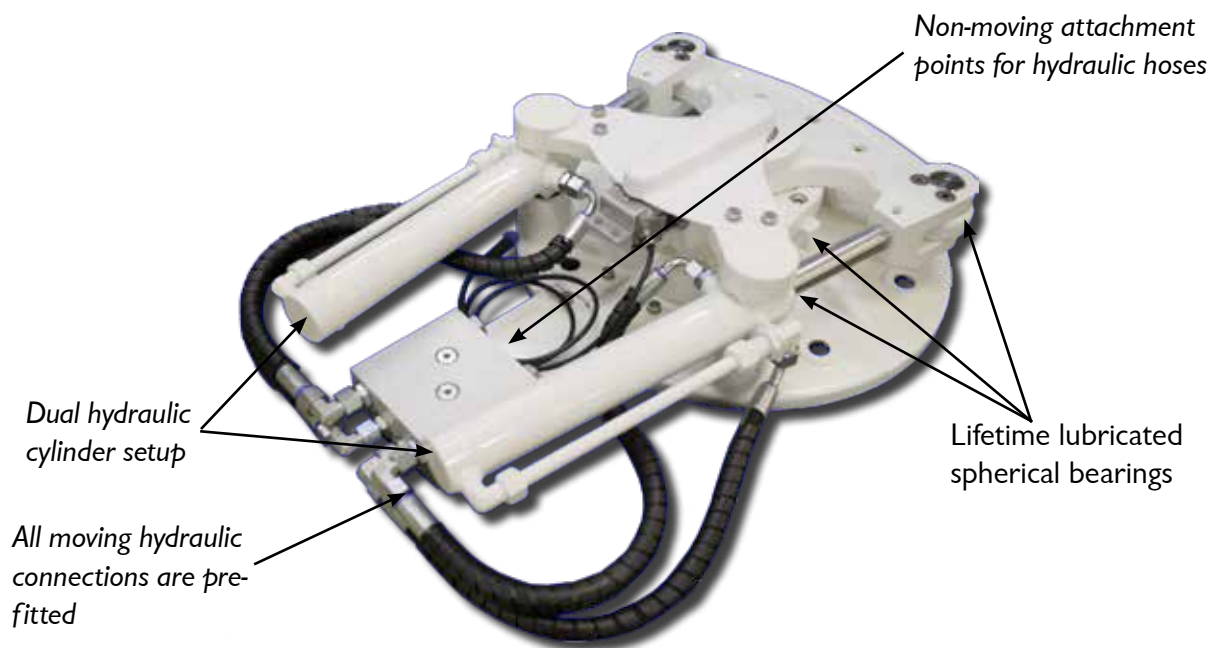
Size compared to other brand actuators for similar fin sizes:



SPS66 / 92 / 93 Actuators

- silent and reliable construction!

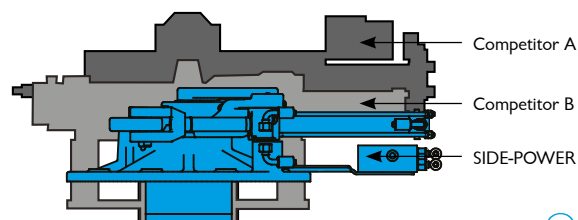
The height inside the boat is a key factor to allow for installation in modern boats. The SPS66 / SPS92 and SPS93 is typically 25% to 75% lower than others. Side-Power actuators for the **vector fins™** are constructed for easy installation and minimal noise reproduction.



Technical design benefits:

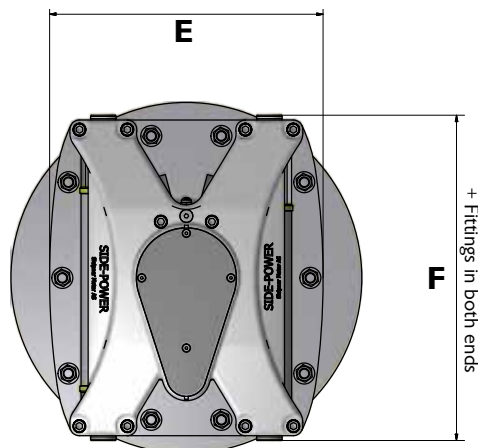
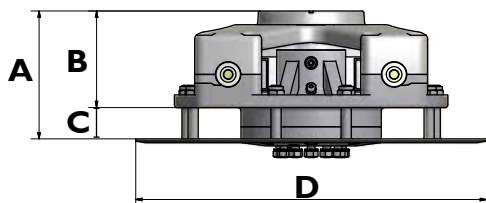
- Precision machining and assembly secures a long lifetime and durability.
- No additional centre lock, this is automatic in the standard hydraulic system - very safe due to the hydraulics having extreme safety limits - actually stronger than the shaft.
- Dual cylinders provide
 - balanced load unlike single cylinder solutions.
 - less bearing load, thereby allowing for a more compact shaft bearing assembly.
- Purpose-designed dual shaft sealing - superior to standard Simmer Ring lip seals.
- Internal hydraulic connections on actuators are pre-fitted, the installer only fits non-moving hoses/pipes - Easier and safer.
- No complex adjustments required to set up controller with lots of factors, these are set automatically on first sea-trial of the boat.
- Bearing and actuator design done with modern structural analysis systems ensures a safe, efficient and compact system.
- No additional centre lock, this is automatic in the standard hydraulic system - very safe due to the hydraulics having extreme safety limits - actually stronger than the shaft.
- Lifetime lubricated SKF bearings.
- Tooling for easy hull preparation.

Size compared to other brand actuators for similar fin sizes:



Measurements

SPS55 & VF650 / VF800

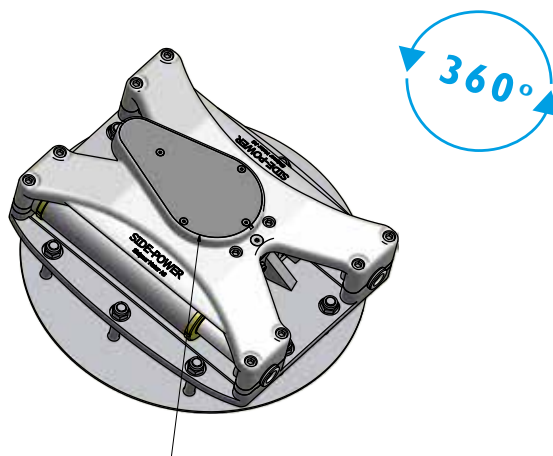


Actuator:

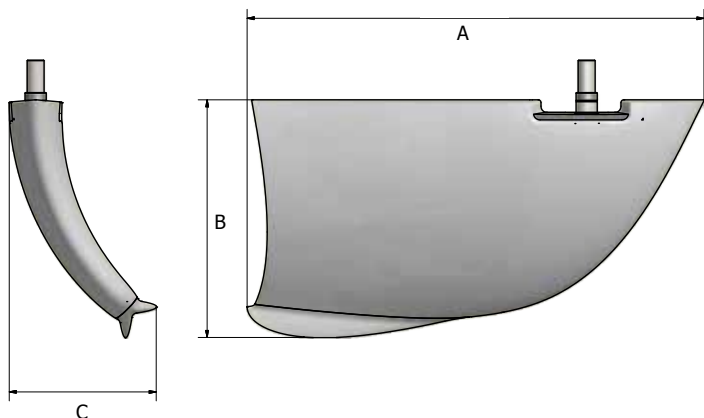
SPS55

A (mm):	201
B (mm):	152
C (mm):	49
D (mm):	550
E (mm):	429
F (mm):	510
Shaft Ø (mm):	64
Weight* (kg)	100

*Complete actuator assembly, per side



Fin actuator assembly may be installed in any convenient radial 360° position in the hull.



Vector fin:

VF650 VF800

Size (m²):	0,65	0,80
A (mm):	1271	1395
B (mm):	661	733
C (mm):	413	457

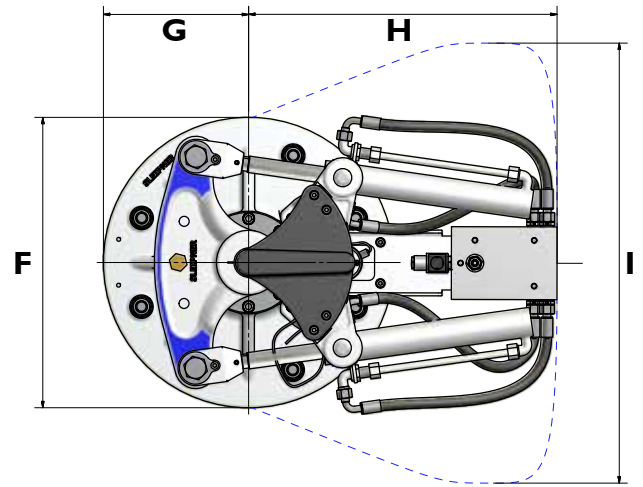
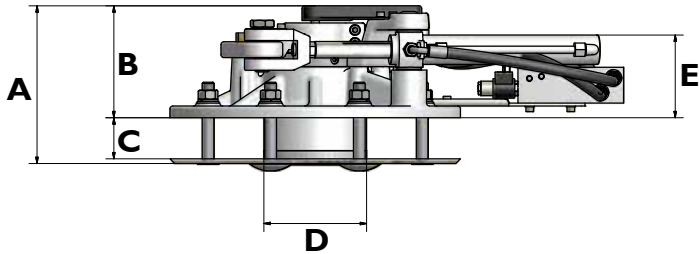
Fins have zero weight in water

Patent pending PCT/NO2013/050067



Measurements

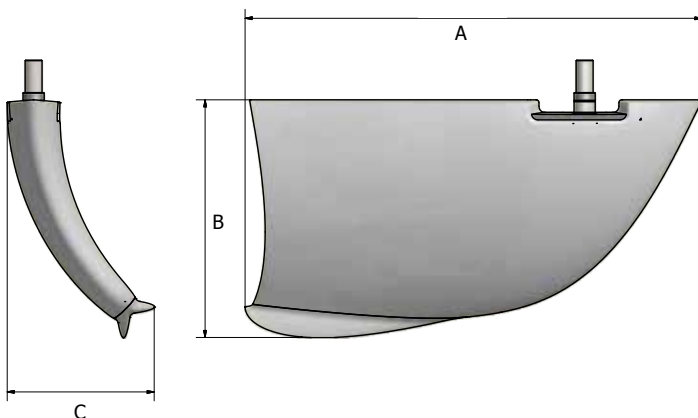
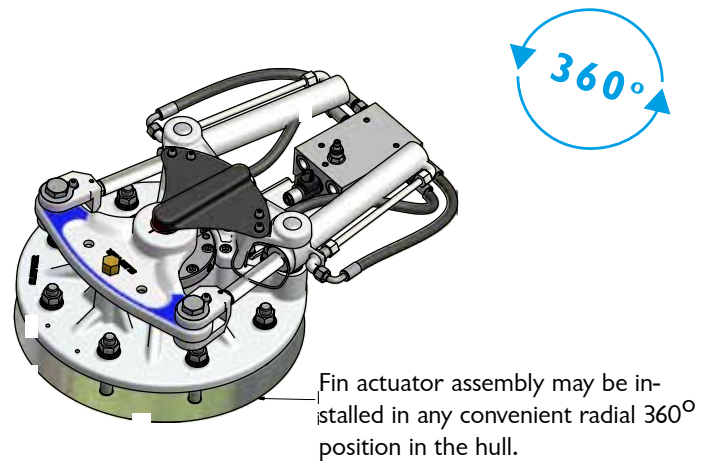
SPS66 / SPS92 / SPS93 & VF1050 / VF1350 / VF1650



Actuator: **SPS66** **SPS92** **SPS93**

A (mm):	260	340	340
B (mm):	190	250	250
C (mm):	70	90	90
D (mm):	175	235	235
E (mm):	146	171	171
F (mm):	495	600	600
G (mm):	247,5	300	300
H (mm):	521	550	550
I (mm):	650	700	700
Shaft Ø (mm):	65	90	90
Weight* (kg)	105	180	183

*Complete actuator assembly, per side



Vector fin: **VF1050** **VF1350** **VF1650**

Size (m²):	1,05	1.35	1.65
A (mm):	1618	1835	2081,0
B (mm):	847	956,5	1054,1
C (mm):	525	595,2	680,7

Fins have zero weight in water

Patent pending PCT/NO2013/050067



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