SLEIPNER
Side-Power

COMMERCIAL PRODUCTS 2022

Index

SLEIPNER

OCEAN BORN. TECH BRED.

Quality legacy

We've lived and worked with the unruly sea for a hundred years. That's why we create products that can create a safer and more comfortable experience at sea – products you can rely on to get the job done.

Beautiful engineering

Our technology is world-class. Our meticulous attention to detail combined with extensive experience as a volume manufacturer is why your workday at sea always will be better with a Sleipner aboard.

Worldwide service

We care. Our global network is there for you to ensure continuous optimal function on your Sleipner solution, even when it has left for distant shores. You can rely on your Sleipner solution, year after year.

Our story

We are a Norwegian technology driven company, focused on creating world leading products and solutions of uncompromised quality to improve safety and comfort at sea. As boaters we know what safety at sea *means*.

So, we don't let our solutions slip out of sight for a second; We manufacture them ourselves, using technologies we have developed ourselves – and we work in close parthership with boat builders and our global service network to ensure optimal function throughout their lifetime.

You know what you get when you install a Sleipner. Our dedication to boating and innovation ensures that our solutions are the benchmark for the industry, today and tomorrow.

SLEIPNER

Thrustworthy • Knowledgeable • Future ready

— This is Sleipner —

Established in Norway in **1908** with more than **113 years of experience.** Sleipner has 200+ employees, including **27 engineers** with more than **250 years combined experience** in the marine industry.

45

Third party sales and service organizations in **45 countries.**

18

18 CNC operators with more than **230 years** combined marine experience.

7

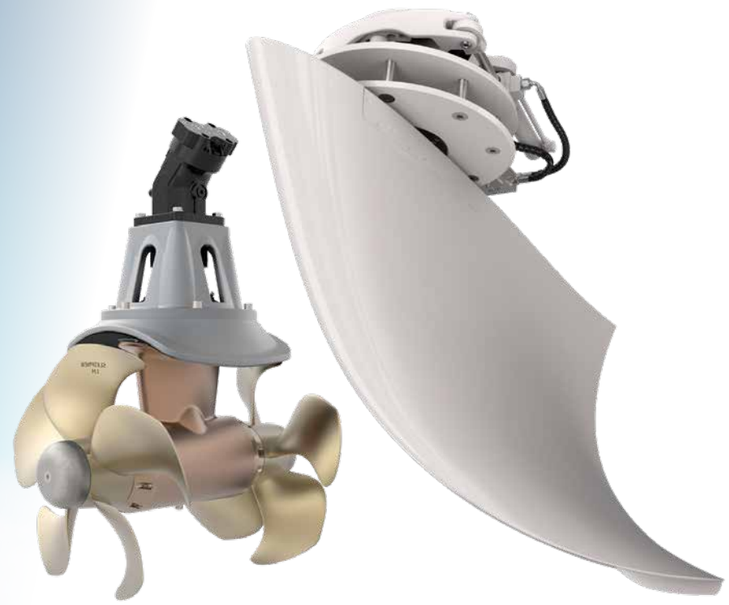
7 subsidiaries providing sales, support and after sales services.

5

Strategic technology partnership with **5 external specialists.**

The boat builder’s choice

Leading boat builders worldwide choose Sleipner for performance, reliability, ease of installation, and unrivaled safety features. This commitment to quality and product development has made the Sleipner range of thrusters the industry benchmark.



The world’s finest reference list

Our focus on quality, reliability, and continuous improvement has led an overwhelming number of the world’s leading boat brands to our customer list. Sleipner solutions are also chosen onboard pilot boats, commercial fishing vessels, navy patrol boats, passenger ferries, and more because of their supreme quality and performance.

”

When choosing a Sleipner product, you choose a product invented, engineered, and manufactured for boaters - by boaters.

CEO Ronny Skauen

The result of over
113 years of experience.
Made in Norway.

2017 DAME DESIGN AWARD WETS
OVERALL WINNER

Vector Fins™

Superior stabilization in every situation

Stabilizer systems have been used on larger passenger ships for a long time. With ever more compact and efficient systems, owners can now enjoy the better usability and comfort on commercial vessels of all sizes.

Up to 55% less side effects

Up to 50% more efficient

What can stabilizers do for you?
Stabilizers reduce the roll movement of a vessel, which is in most situations by far the most dominant and most uncomfortable motion. So reducing roll by a good percentage will make a substantial difference in comfort and safety on board.

However, it is not always so clear what type of stabilization system to choose because the two leading technologies (fins and gyros) have significant functional differences, meaning that no one type suits all boats or all owners' cruising priorities.

Key things to consider
- Choose the right stabilization technology to match the type of boating you do.
- Check the practical limitations of your boat – not all systems will fit all boats, mainly due to space limitations.
- Consider what is best suited to your boat and what is likely to retain the most value when the time comes to sell – some sizes and style of boat lean more towards one technology than another.

Understanding the basics
The roll forces depend not just on the wave height but also on the time during which it affects the boat (wavelength). Another big factor is the speed of the boat: force = speed2.
Gyro-type stabilizers are installed inside the boat and get their total roll reduction force from the precession motion that they generate to resist the roll of a boat. They have the same total force regardless of wave period and boat speed with limited force.

Fin stabilizers on the other hand act in the water and have two ways of creating roll reduction force, depending on the boat's speed. At zero speed or 'at anchor' mode, the fins rotate rapidly (flap) to generate force and like the gyro, have a definite limit. However, when the boat is moving forward, fins also generate roll reduction forces by the angle at which they pass through the water, like adjustable airplane wings or underwater foils. This force increases by speed squared, so the faster the boat moves, the more force they generate.

Vector Fins™ stabilizers

- Unlike Gyros, efficiency increases with speed
- Minimal to no increase in fuel consumption
- Minimal to no loss of speed
- Silent all night operation
- Minimal internal space requirement
- Also suitable for retrofit

Which system is right for you?
If your only priority is having stabilization at zero speed, with these size choices, the gyro will eliminate more roll than the fins when anchored. However, if you also use your boat on longer cruises and want to have excellent stabilization when cruising in the open sea between sheltered anchorages, fins have a colossal force benefit. They can reduce or eliminate many times the wave height and length of a gyro of this size.

”We hoped for 50% effect, dreamed of 70%, and ended up getting 90% effect!

Video:
***Ola Tønder,** owner of Grip Shipping on his experience after retrofitting the former rescue vessel MS Hagbart Waage with Sleipner Stabilizers.*

Demanding working conditions?

Elimination of roll – at anchor and underway!

You can't calm the sea, but you can manage the effect of it.
And by a lot too. Our award-winning Vector Fins™ reduces a boat's roll underway by up to 90 percent, without any significant loss of speed or consequential extra fuel consumption. That's unique. But what's even more remarkable is that these innovative stabilizers also reduce roll at anchor by an outstanding 70 percent!

The numbers above are significant. Considering the fact, they are literally stating the difference between getting the job done or not. Seasickness reduction by Vector Fins™ is rated to a whopping 97 and 90 percent underway and at anchor, respectively. Now that makes the sea a whole different workplace.

A stabilizer system with Vector Fins™ is the only system that effectively handles both cruising and at anchor situations.

Performance of different stabilizer technologies

Due to their design, gyro stabilizers provide a constant force to stabilize a vessel, while fin stabilizers increase the forces by the square of the speed which makes big difference.

Vector Fins are up to 30% more efficient when cruising and up to 50% more efficient when anchoring compared to old style flat fins. Unwanted additional effects in terms of yaw and swaying can be reduced by up to 55% compared to flat fins.

Gyro stabilizers require a start-up time of 30-45 minutes until they function optimally and are more suited for anchoring due to their construction.

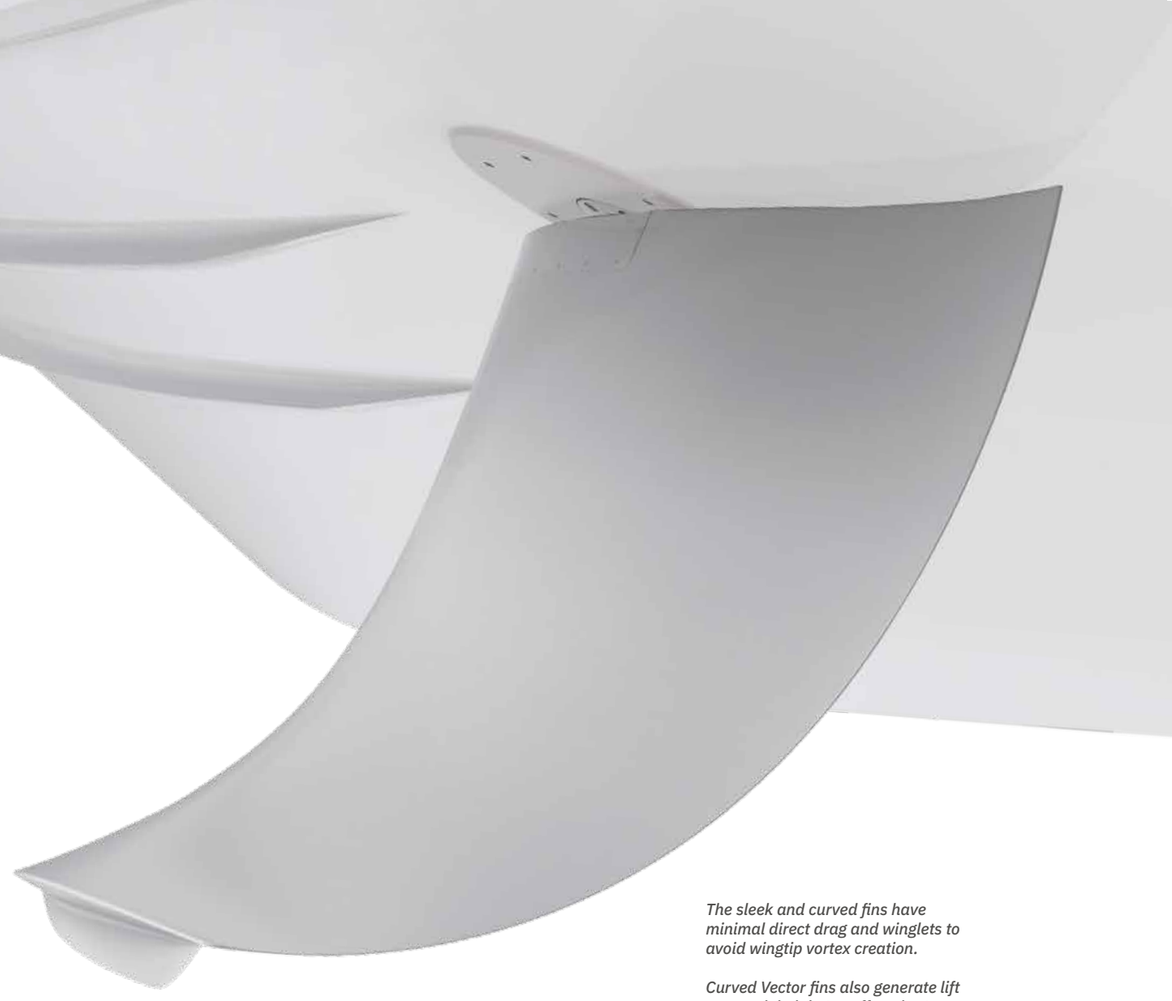
	When moored or at anchor	Underway in moderate wind and weather conditions	Underway in demanding contidions	Start-up time until maximum performance
NO Stabilizer	⊖	⊖⊖	⊖⊖⊖	
GYRO	⊕⊕⊕	⊕⊕	⊕	⊖⊖⊖
FLAT FINS	⊕	⊕⊕	⊕⊕	⊕⊕⊕
VECTOR FINS™	⊕⊕⊕	⊕⊕⊕	⊕⊕⊕	⊕⊕⊕

Vector Fins™
- it’s all about the physics

Most boaters who have ever had a stabilised boat would never buy another boat without. Most stabilizer systems on the market today will make a huge impact on onboard comfort, safety and second hand boat value.

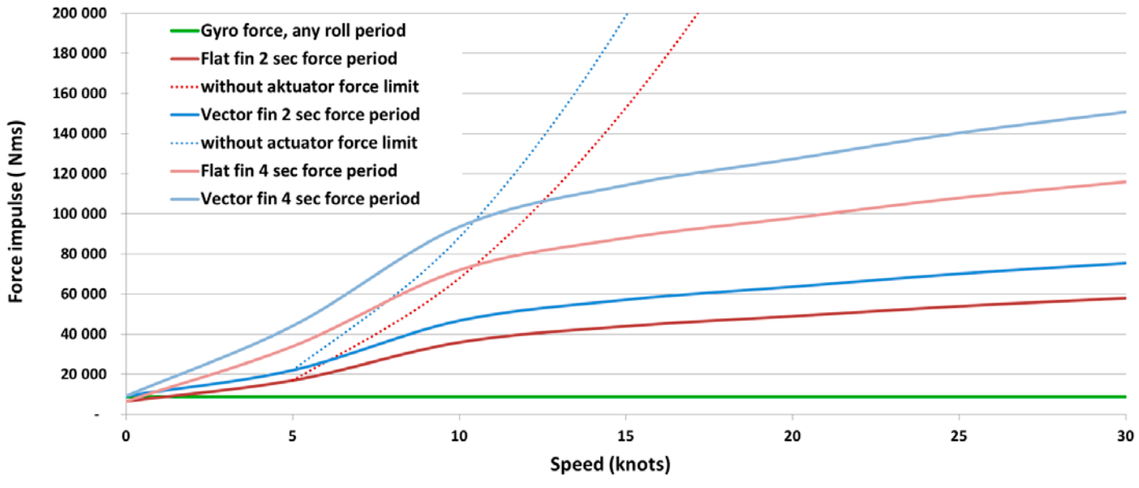
However, there are important technological and effeciency differences that must be considered to choose the optimal system for a given boat.

The two most common roll reducing systems on the market today are gyro and fins. It is well established that fins are better for those who want effective stabilization both at anchor and underway, while gyro is good choice for boaters who are primarily focused on at anchor stabilization. The reason is that gyro stabilizers has a maximum stabilization force while fins will increase their stabilising effeciency with speed by a factor of 2.



The sleek and curved fins have minimal direct drag and winglets to avoid wingtip vortex creation.

Curved Vector fins also generate lift at speed, helping to offset drag.



Verified stabilization test results 56ft planing hull with 0,6m² Vector Fins™

	No stabilizer	Vector Fins™	Reduction of roll	Reduction of seasickness
Cruising at 11 knots				
Maximum roll movement	10.4°	0.3°	97%	99.8%
Average roll movement	5.7°	0.15°	97%	99.9%
At Anchor				
Maximum roll angle	9.4°	2.6°	72%	92%
Average roll angle	4.1°	1.4°	66%	88%

Vector Fins™

The most efficient stabilizer system on the market

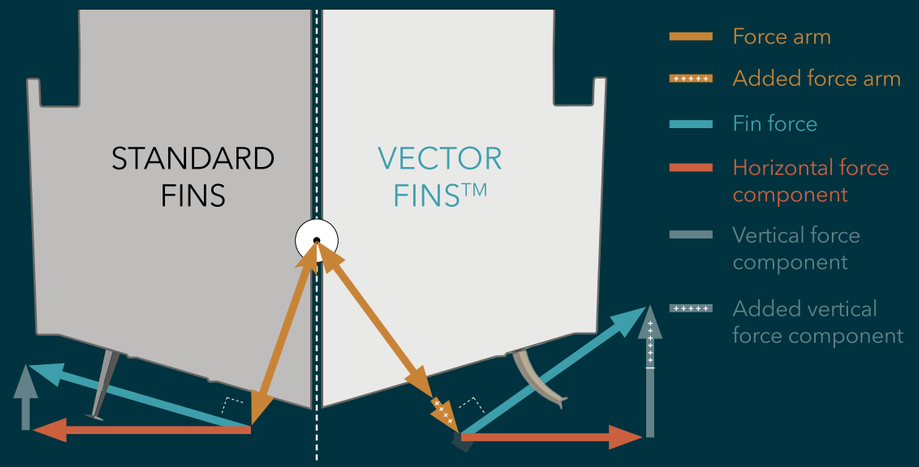
Rolling around at sea is something most people will prefer to avoid if they can. With the modern stabilizing systems available on the market today, they do reduce the risk of becoming seasick by 80-90 percent.

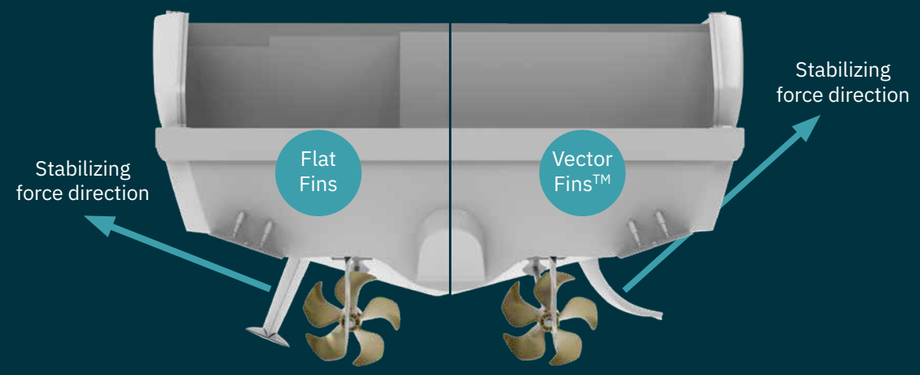
Another aspect worth considering is plain and simple onboard safety.

Let's forget about seasickness and general onboard comfort for a while. A roll of just a few degrees impacts your footing onboard. Unexpected swells catch you off guard and send objects flying around. We've all been there. A stabilized boat is a very different base in terms of both perceived and actual safety.

Over the last few years, roll stabilization has become a must-have for boat owners due to the impressive increase in comfort it delivers. Stable conditions on and below deck reduce injuries to the crew and minimize the potential risk of damage to your cargo.

Up to
97%
roll reduction





Vector Fins™ –
more stabilization force in every situation

Vector Fins™ – a revolutionary generation of fin stabilizers

Vector Fins™ is the only top-performing stabilizer system that handles both cruising and at anchor-use, with the “at anchor” stabilization force deciding the size of the fins.

Vector Fins™ – a simple solution to a complex problem!
The Vector Fins™ stabilizers dramatically improve the roll reduction efficiency while at the same time reducing undesired yaw and sway motions caused by active fins.

The fins are made as a “one shot” vacuum injected vinylester process over pre-shaped core material in a closed mold method.

Designed with rowing and mat layers to ensure maximum strength and minimum weight. Can even withstand minor damages without totally disintegrating afterwards, unlike traditional production methods often allows.

Underway
Unlike Gyro stabilizers that always have the same maximum total force they can apply to reduce roll, independant of boat speed or roll periods, fin stabilizers increase their stabilization force by both speed and roll period when “cruising”.

At Anchor
As most boat owners spend more time at anchor than underway, it is critical that the stabilization system performs well at any speed, including no speed.

A stabilized boat offers a significant increase in onboard well-being. Working on board becomes a lot easier and safer on a stabilized boat.

- Up to 50% more efficient than flat fins
- Up to 55% less side effects than flat fins
- Advanced hydrodynamic fin design
- 20% – 50% less resistance than other fins, results in > virtually no loss of speed and thereby no added fuel consumption
- All fins are prepared for high efficiency in “Any Speed” – 2:1 size ratio, also “At Anchor”
- “one-shot” vacuum injected vinylester process
- rowing and math layers to ensure maximum strength

Product features

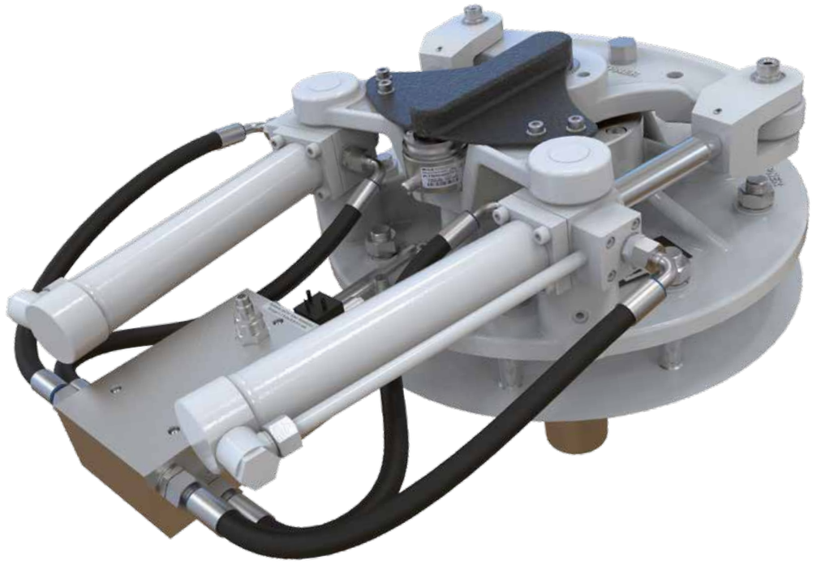
- S-LINK™
- ANY SPEED
- HYDRODYNAMICAL SHAPE
- INSTANT-ON (Max power at Start-Up)

Technical details

Ideal Vessel Class	Commercial
Ideal Vessel Size	9–55 m / 50–140 ft
Power	Electrohydraulic
Rated Power	3,5–15 kW
Actuator Position	360°

Actuators

The height inside the boat is often the key measurement to allow for installation in modern boats. The Sleipner actuators are typically 25% to 75% lower than others. They are constructed for easy installation and minimal noise reproduction.

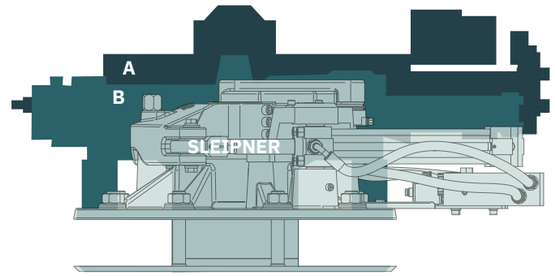


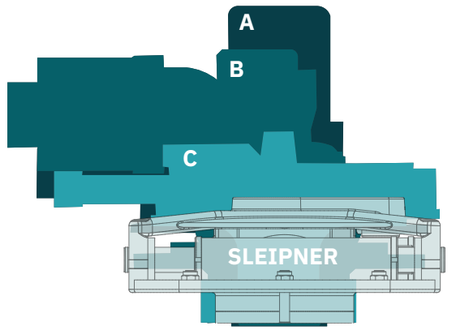
Technical design benefits

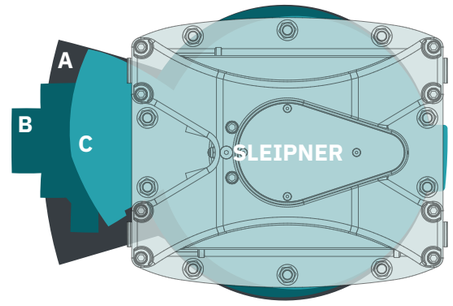
- Precision machining and assembly ensures a long lifetime and durability.
- No additional center lock, this is automatic in the standard hydraulic system – very safe due to the hydraulics having extreme safety limits.
- Dual cylinders provide
  - balanced load unlike single cylinder solutions.
  - less 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 from factory, the installer only connects 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 seatrial of the boat.
- Most stabilizer systems require you to periodically service their bearings, meaning either a part change, lubrication and/or mechanical adjustments. Side-Power's latest generation of bearings do not need any of that, saving time and money for the owner with lifetime lubricated high-end bearings as standard, meaning one less service point on your vessel.
- Fins are installed and removed very easily and quickly from the outside for best convenience in transport or other haul-out situations where this might be needed.
- Defined shaft-shear point in case of the fins accidentally hitting something.
- All exterior parts are in stainless steel.

Advantages of a centralized hydraulic power system

- High efficiency for moving and holding high loads
- Proven and reliable technology
- Most used power system on boats from 60-70 feet and larger
- Can power many applications from one central hub
- Low maintenance
- Silent operation







Size of Sleipner actuators compared to other brand actuators for similar fin sizes

Sleipner actuators

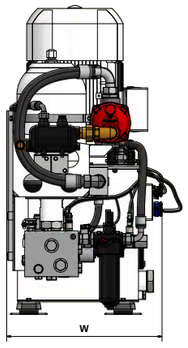
The most compact actuator

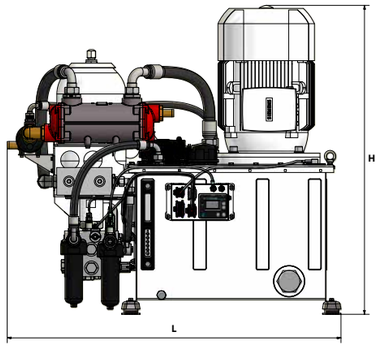
Compact, quiet and easy to install

Hydraulic Power pack for standalone installations

This a complete hydraulic power unit (HPU) for installations where the vessel does not have a hydraulic thruster system. All of the hose and wire connections are pre-installed, allowing for faster system install and startup in the field. All connections are focused on two sides of the tank, allowing installation in confined spaces.

We also offer pre-connected and easy to install central hydraulic systems with S-Link™ CAN bus system.





Power pack	10 4435C-W-01	10 4450C-W-01	10 4455C-W-01	10 4475C-W-xx-xx	10 44110C-W-xx-xx	10 44150C-W-xx-xx
Rated power (kw)	3.5	4.6	5.5	7.5	11	15
Weight (kg • lbs)	111 • 245	116 • 256	135 • 298	N/A	300 • 661	312 • 687
L (mm • in)	726 • 28.6	726 • 28.6	780 • 30.7	1087 • 42.8	1087 • 42.8	1087 • 42.8
W (mm • in)	432 • 17	432 • 17	465 • 18.3	506 • 19.9	506 • 19.9	506 • 19.9
H (mm • in)	762 • 30	756 • 29.8	790 • 31.1	1006 • 39.6	1006 • 39.6	1006 • 39.6
Generator load (kVA)*	4.6	6	7	9.8	13	18
For fin size (short r. p.)*	VF650 (SPS55)	VF800 (SPS55B)	-	VF1050 (SPS66B)	VF1350 (SPS93B)	VF1650 (SPS93B)
For fin size (long r. p.)*	VF650	VF800 (SPS55B)	VF1050 (SPS66B)	VF1350	VF1350 (SPS93B)	VF1650 (SPS93B)

** Single phase supply will increase current with factor 1.73 and will require more margins on generator capacity.*
** ECO mode available in new 2018 control system for reduced generator load.*
xx-xx - available in 230V 1-phase, 230V 3-phase and 400V configuration.

** Short r. p. = Short roll period*
** Long r. p. = Long roll period*
Roll period is the time between two waves

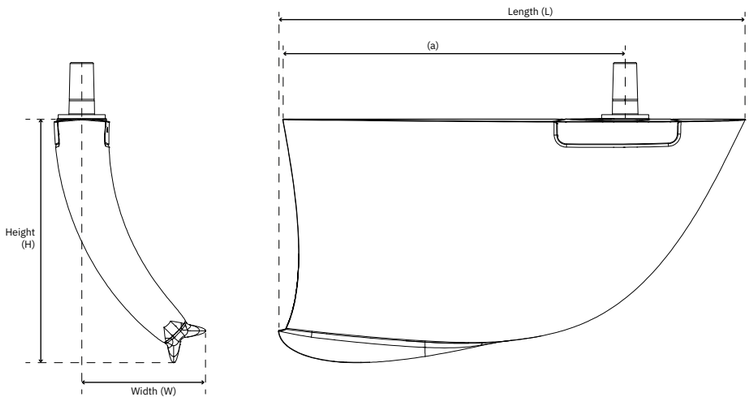
DMC-SCU Dynamic Motion Controller TP-43

4,3” Sunlight color touch panel for ease of use and control. Multiple Control panels can be installed in one system.

- 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 centered 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™ integrates common intelligence with thruster systems and main hydraulics
- Can be flushed mounted
- Built-in Wi-Fi module
  - Allows for software upgrades for the S-Link™ system without additional computer tool or service technician
  - Allows for faster support, as service technicians can remotely access the control system upon request.

S-LINK™

Vector Fins™



Vector Fin	VF650	VF800	VF1050	VF1350	VF1650	VF1950

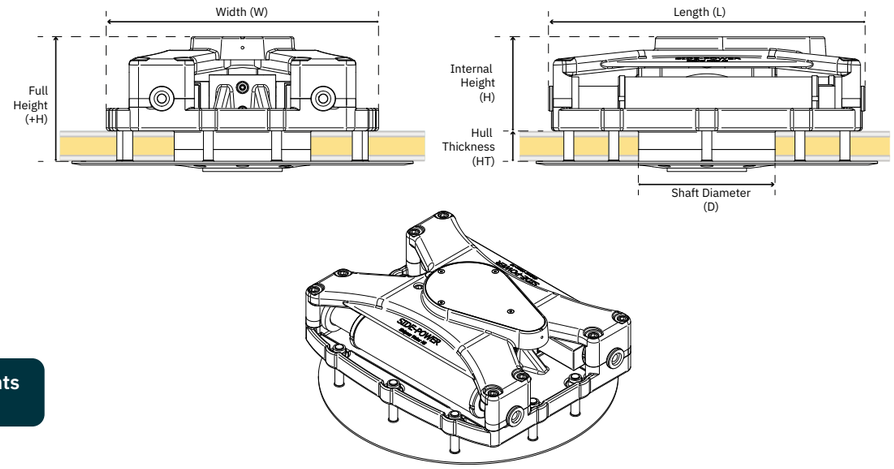
Vector Fins™	VF650	VF800	VF1050-66	VF1350	VF1650	VFS1950-M
(H) Height (mm)	661	733	847	956.5	956.5	1054.1
(L) Length (mm)	1271	1395	1618	1835	1835	2081
(W) Width (mm)	337	337	429	485	485	533
Size	VF650	VF800	VF1050	VF1350	VF1650	VF1950-A/M/HS
Weight	0 weight in water	0 weight in water	0 weight in water	0 weight in water	0 weight in water	0 weight in water

Fins have zero weight in water

Patents: sleipnergroup.com/patents

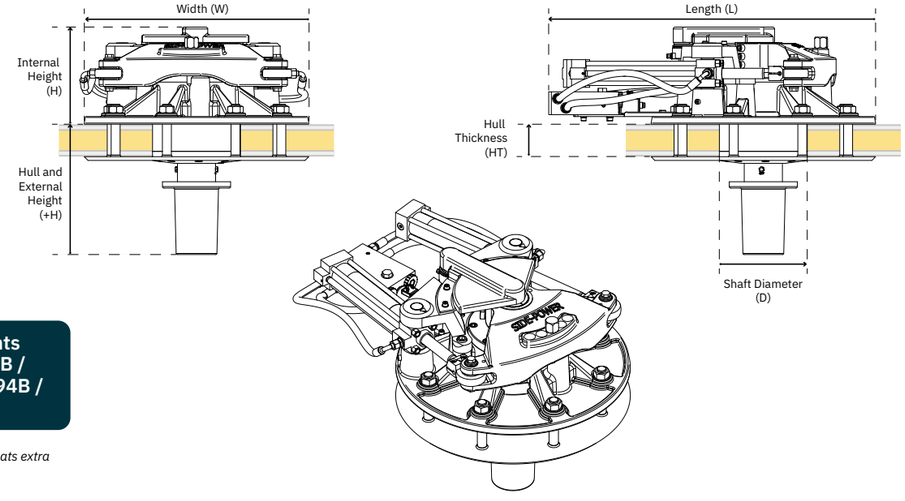
Actuator

Measurements SPS55B

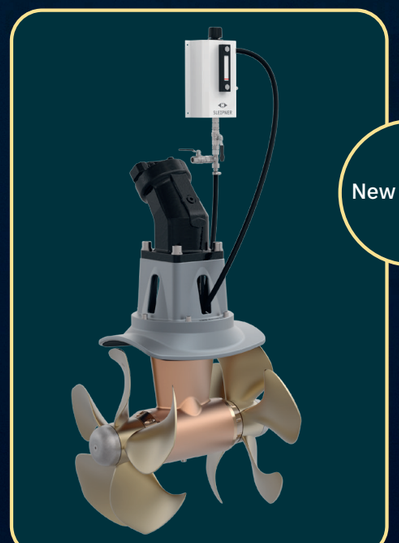


Measurements SPS66B / 67B / 92B / 93B / 94B / 96B / 97B

For metal framed boats extra actuator available



Actuator	SPS55B	SPS66B	SPS67B	SPS92B	SPS93B	SPS94B	SPS96B	SPS97B
(H) Height (mm)	149.5	190	190	260	260	260	346	346
(+H) Additional Height (mm)	201	318	-	347	347	-	-	-
(L) Length (mm)	510	770	770	871	871	871	871	871
(W) Width (mm)	430	650	650	700	700	700	700	700
(D) Diameter (mm)	-	175	175	235	235	235	235	235
(HT) Hull Thickness (mm)	49	70	159	86	86	237	86	237
Weight	100	105	114	185	185	190	185	190



New feature

Main thruster features

AT SEA SERVICE
OIL REFILL

All thrusters for tunnel diameter 513 and 610 mm can now be delivered prepared for an on-water oil change. Eliminating the need to dry-dock the vessel for a scheduled oil change keeps the vessel operational and minimizes thruster service costs.

GALVANIC
SEPARATION

Immersed parts exposed to seawater are galvanic isolated from the onboard electrical system, eliminating stray currents.

GRAVITY FEED
LUBRICATION

The thruster gearleg is supplied with oil from a separate reservoir above the waterline. This generates overpressure, making an effective seal against water intrusion while allowing easy access for oil change.

IGNITION
PROTECTION

Our ignition-protected products are compliant with ISO 8846 and ensure gasoline or other flammable fumes cannot enter or be ignited.

INTELLIGENT
POWER CONTROL

Intelligent Power Control provides a delay between drive directions and monitors solenoid functions. In case of a solenoid lock-in, the thruster will automatically stop without extra user action or controlling the main switch.

OVERHEAT
PROTECTION

Automatic detection of overheating of internal components. When an unsafe temperature is detected, the unit is automatically shut off to prevent overheating.

PRO™
VARIABLE SPEED CONTROL

A PRO™ thruster system enables you to apply only the necessary power to complete your maneuver. The variable speed control allows you to use limited power in calm conditions, eliminating the noise associated with on/off thrusters while offering longer run times.

With a dual setup (bow and stern), you also get a practical hold function enabling you to set and leave the level of thrust. With a single button press on the control panel, you can push the boat sideways against the pier, allowing you to handle large boats entirely on your own.

Our PRO™ models are by far the best choice if you want to integrate your thrusters into your boat's joystick navigation and the most satisfactory option for more powerful configurations.

Q-PROP

The Q-PROP™ has measured noise reductions of up to 75% in controlled environments. Upgrade kits are available for most Sleipner thruster models with special adaptors.

SAFE STARTUP

Sleipner control panels use dual ON buttons to engage the product to start, preventing accidental activation for a child-safe environment and peace of mind while on your vessel.

SEALED DRIVE
LUBRICATION

The thruster gearleg is pre-filled for lifetime lubrication and sealed using a long-time mechanical seal with ceramic and carbon surfaces for ultimate security against water intrusion.

S-LINK™

S-Link™ is a CAN-based control system used for communication between Sleipner products installed on a vessel.

- Compact and waterproof plugs
- Keyed and color-coded connectors to ensure correct and easy installation
- Different cable lengths, extenders and T-connectors makes the system scalable and flexible to install

SMART
SHUT-OFF

Sleipner control panels are programmed to shut down automatically after approximately 6 minutes without use to avoid accidental activation.

AC electric tunnel thrusters

Sleipner's AC thrusters offer the benefit of unlimited run time, enabling heavier duty usage. Each system is custom-built according to your boat's specifications and working conditions. AC thrusters are also perfect for hybrid or fully electric vessels.

©OCEA FPB 100 SOKAN

Sleipner's AC thruster systems are precisely matched to the generator capacity to maximize the amount of thrust you get from the system.

Each AC motor is controlled via a Variable Frequency Drive (VFD) to minimize startup loads on the power system and allow for precise control of the thruster with variable speed control. No further setup of the VFD is required. The PDC-301 drive controller is configured from the control panel.

In addition to the standard VFD's, we can deliver low harmonic VFD's for installations with specific THD requirements.

An Electromagnetic Compatibility (EMC) is also included to reduce feedback noise on the vessel's power system.

The innovative S-Link™ control system ensures fast and trouble-free installation, and gives you the unique option to combine hydraulic and AC thrusters in a single control environment.

All of Sleipner's AC systems can be mixed and matched with hydraulic and DC Electric PRO systems with seamless integration.

All AC components are selected from top brand manufacturers ensuring the best quality and worldwide support. Standard range is designed for 230V / 400V. Setup for alternative power supply specifications can be delivered on request.

Benefits

- Continuous use
- Controlled power
- Reliability
- S-Link™ operating system
- Custom-made, ready to install with Plug & Play wiring
- The choice of leading boatbuilders
- DNV type approval for specific models
- Cost efficient, high quality components
- Suitable for joystick and DP integration

TYPE APPROVED PRODUCT DNV DNV.COM/AF

Specific models

Complete AC thruster kit including
- *PDC 301 drive controller*
- *Variable Frequency Drive (VFD)*
- *Gearleg with propellers and bracket*
- *Flexible coupling*
- *AC motor*
- *EMC filter*

Image courtesy of Sunseeker Inc.

Product features

- S-LINK™
- SEALED DRIVE LUBRICATION
- GRAVITY FEED
- Q-PROP™
- GALVANIC SEPARATION (optional)
- PRO™

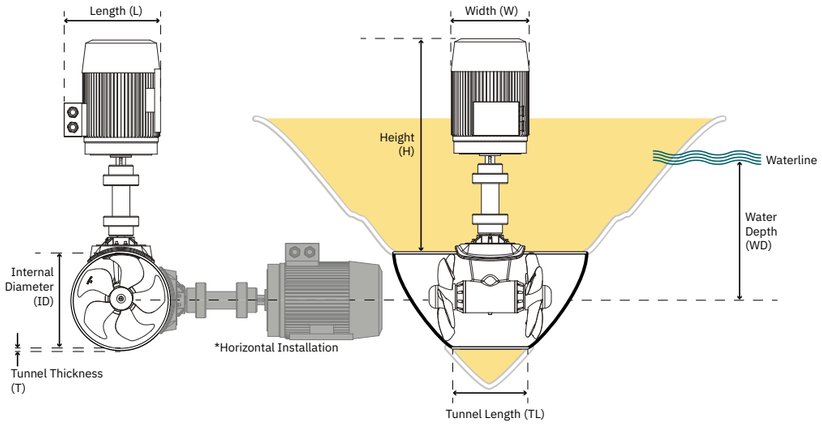
Technical details

Ideal Vessel Class	Commercial
Ideal Vessel Size	13–55 m / 42–175 ft
Power	AC 230/400 V
Thrust cont.	240–1200 kg/529–2646lbs
Thrust max.	240–1400 kg/529–3086 lbs
Tunnel diameter	250–610 mm
Placement	Bow / Stern

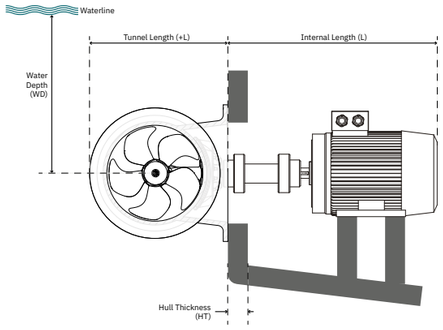
For light usage

	SAC240/250-C	SAC320/300-I	SAC360/300-C	SAC450/386-C	SAC520/386-I	SAC520/386-C
Continous Thrust (kg)	240	280	360	450	450	520
Thrust, max. (kg) [1]	-	320	-	-	520	-
Power Output (kW • Hp)	14 • 19	21 • 27	27 • 37	28 • 38	35 • 48	35 • 48
Ideal Vessel Size (m/ft)	13-23/42-75	17-31/55-100	18-33/59-108	22-35/75-110	25-40/85-140	25-40/85-140
Internal Diameter (mm)	250	300	300	386	386	386
CE approved	Yes	Yes	Yes	Yes	Yes	Yes
PRO™	Yes	Yes	Yes	Yes	Yes	Yes
Control system	S-Link™	S-Link™	S-Link™	S-Link™	S-Link™	S-Link™
Q-PROP™	Yes	Yes	Yes	Yes	Yes	Yes
Propulsion system	Twin Counter	Twin Counter	Twin Counter	Twin Counter	Twin Counter	Twin Counter
Lubrication	Sealed	Sealed	Gravity feed	Gravity feed	Gravity feed	Gravity feed
Galvanic separation [2]	No	No	No	No	No	No

Bow	Description
(H)	Height
(L)	Length
(W)	Width
(ID)	Internal Diameter
(WD)	Water Depth
(TL)	Recommended Tunnel Length
(TL min.)	Minimum Tunnel Length
(T min.)	Minimum Tunnel Wall Thickness
(T max.)	Maximum Tunnel Wall Thickness
Stern	
(L)	Internal Length
(+L)	Tunnel Length
(WD)	Stern Water Depth
(HT)	Maximum Hull Thickness



Sleipner thrusters can be installed at an angle off the vertical centre. Tailored to fit any space available in your vessel.



Please see note regarding thruster power and battery rating on page 114.
[1] Max thrust is available until motor temperature will reduce performance to continuous thrust rating
[2] Isolation kit for galvanic separation available
[3] Weight stated is for complete thruster unit, excluding VFD

For heavy duty usage

SAC400/300-C	SAC700/412-C	SAC750/513-I	SAC900/513-I	SAC1100/513-I	SAC1100/513-C	SAC1300/610-I	SAC1400/610-I
400	700	600	750	900	1100	1100	1200
-	-	750	900	1100	-	1300	1400
30 • 41	42 • 57	41 • 56	53 • 72	70 • 95	70 • 95	74 • 101	83• 113
18-33/59-108	29-44/95-145	29-44/95-145	30-45/100-150	32-49/105-160	32-49/105-160	40-52/130-170	40-55/130-175
300	412	513	513	513	513	610	610
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
S-Link™	S-Link™	S-Link™	S-Link™	S-Link™	S-Link™	S-Link™	S-Link™
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Twin Counter	Twin Counter	Twin Counter	Twin Counter	Twin Counter	Twin Counter	Twin Counter	Twin Counter
Gravity feed	Gravity feed	Gravity feed/ On water change	Gravity feed/ On water change	Gravity feed/ On water change	Gravity feed/ On water change	Gravity feed/ On water change	Gravity feed/ On water change
No	No	No	No	No	No	No	No

Measurements (mm)	H	L	W	ID	WD	TL	TL min.	T min.	T max.	Weight[3] kg
SAC240/250 (horizontal version)	688	347	262	250	380	550	300	7	10	68
SAC240/250 (vertical version)	688	347	262	250	380	550	300	7	10	68
SAC320/300 (horizontal version)	703	347	262	300	450	550	300	10	10	71
SAC320/300 (vertical version)	703	347	262	300	450	550	300	10	10	71
SAC360/300 (horizontal version)	774	397	313	300	450	550	370	10	10	105
SAC360/300 (vertical version)	774	397	313	300	450	550	370	10	10	105
SAC400/300 (horizontal version)	774	397	313	300	450	550	370	10	10	111
SAC400/300 (vertical version)	774	397	313	300	450	550	370	10	10	111
SAC450/386 (horizontal version)	999	439	356	386	580	750	500	10	15	189
SAC450/386 (vertical version)	999	439	356	386	580	750	500	10	15	189
SAC520/386 (horizontal version)	999	439	356	386	580	750	500	10	15	189
SAC520/386 (vertical version)	999	439	356	386	580	750	500	10	15	189
SAC700/412 (horizontal version)	964	439	356	412	620	800	550	12	16	205
SAC700/412 (vertical version)	964	439	356	412	620	800	550	12	16	205
SAC750/513 (horizontal version)	1079.5	496	396	513	700	1000	750	12	22	330
SAC750/513 (vertical version)	1079.5	496	396	513	700	1000	750	12	22	330
SAC900/513 (horizontal version)	1193.5	563	449	513	700	1000	750	12	22	450
SAC900/513 (vertical version)	1193.5	563	449	513	700	1000	750	12	22	450
SAC1100/513-C (horizontal version)	1303.5	642	495	513	770	1000	750	12	22	450
SAC1100/513-C (vertical version)	1303.5	642	495	513	770	1000	750	12	22	450
SAC1100/513-I (horizontal version)	1193.5	563	449	513	770	1000	750	12	22	575
SAC1100/513-I (vertical version)	1193.5	563	449	513	770	1000	750	12	22	575
SAC1300/610 (horizontal version)	1305	712	555	610	900	1000	750	14	24	680
SAC1300/610 (vertical version)	1305	712	555	610	900	1000	750	14	24	680
SAC1400/610 (horizontal version)	1305	712	555	610	900	1000	750	14	24	740
SAC1400/610 (vertical version)	1305	712	555	610	900	1000	750	14	24	740

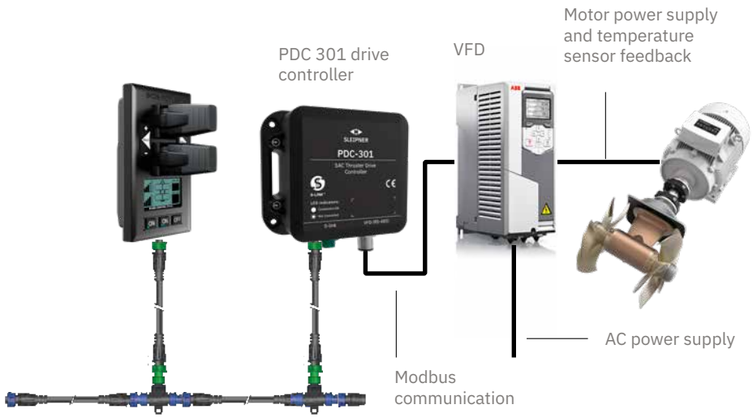
AC components

AC Thrusters are delivered as a complete ready to install kit.
- PDC301 drive controller
- Variable Frequency Drive (VFD)
- Gearleg with propellers and bracket
- Flexible coupling
- AC motor
- EMC Filter

Each AC thruster system is configured according to the specific working conditions and specifications. No further setup of the VFD is required. The PDC301 is configured from the PJC control panel.

The S-Link™ control system ensures fast and trouble-free installation, and gives you the unique option to combine hydraulic and AC thrusters in a single control environment.

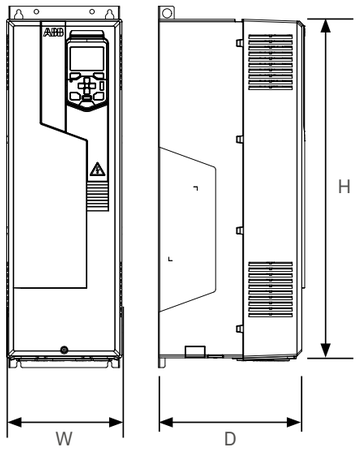
All with variable speed control.



S-Link™ control system

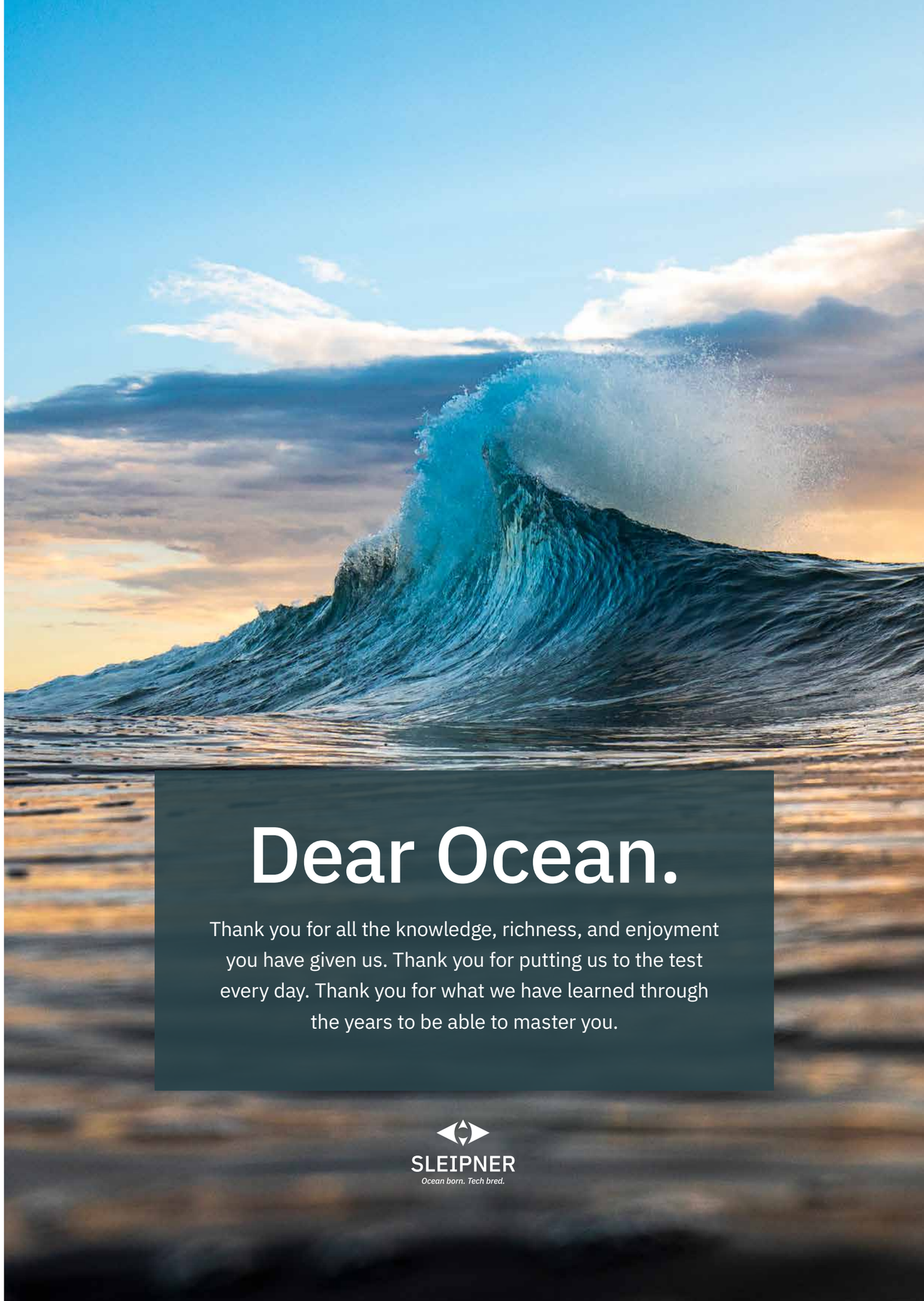
PDC 301 drive controller
- Communication with VFD by Modbus connection
- Included 3-wire cable for connection to VFD Modbus terminals
- Monitoring and diagnostics
- Firmware upgrade through S-Link™ programmer

Variable frequency drive (VFD)



VFD protection: IP21
IP55 on request

VFD	Thruster model	VFD model	Weight (kg)	D (mm)	W (mm)	H (mm)
SAC240	SAC240/250-C-2-x²	ACS580-01-047A-2	11,8	228	203	454
	SAC240/250-C-4-x²	ACS580-01-033A-4	11,8	228	203	454
SAC320	SAC320/300-C-2-x²	ACS580-01-076A-2	19	258	203	600
	SAC320/300-C-4-x²	ACS580-01-046A-4	11,8	228	203	454
SAC360	SAC360/300-C-2-x²	ACS580-01-115A-2	28,3	295	203	732
	SAC360/300-C-4-x²	ACS580-01-073A-4	19	258	203	636
SAC400	SAC400/300-C-2-x²	ACS580-01-115A-2	28,3	295	203	732
	SAC400/300-C-4-x²	ACS580-01-073A-4	19	258	203	636
SAC450	SAC450/386-C-2-x²	ACS580-01-115A-2	28,3	295	203	732
	SAC450/386-C-4-x²	ACS580-01-062A-4	19	258	203	600
SAC520	SAC520/386-I-2-x²	ACS580-01-144A-2	42,4	369	252	727
	SAC520/386-I-4-x²	ACS580-01-089A-4	28,3	295	203	732
	SAC520/386-C-2-x²	ACS580-01-144A-2	42,4	369	252	727
	SAC520/386-C-4-x²	ACS580-01-089A-4	28,3	295	203	732
SAC700	SAC700/412-C-2-x²	ACS580-01-171A-2	54	370	284	880
	SAC700/412-C-4-x²	ACS580-01-106A-4	28,3	295	203	732
SAC750	SAC750/513-I-4-x²	ACS580-01-089A-4	28,3	295	203	732
SAC900	SAC900/513-I-4-x²	ACS580-01-106A-4	28,3	295	203	732
SAC1100	SAC1100/513-I-4-x²	ACS580-01-145A-4	42,4	369	252	727
	SAC1100/513-C-4-x²	ACS580-01-145A-4	54	370	284	880
SAC1300	SAC1300/610-I-4-x²	ACS580-01-169A-4	54	370	284	880
SAC1400	SAC1400/610-I-4-x²	ACS580-01-169A-4	54	370	284	880



Hydraulic tunnel thrusters

Power from 100 kg to 1400 kg and continuous operation make a hydraulic thruster system ideal for yachts, super yachts and professional vessels. It is the natural choice when extensive thruster usage or long run cycles are required.

For all the hydraulic components to be compatible and maintain the same high quality, Sleipner offers complete hydraulic systems with guaranteed performance. Sleipner hydraulic systems use only brand-name hydraulic components, ensuring reliability and easy worldwide access to spare parts and service.

The innovative S-Link™ control system ensures fast and trouble-free installation, and gives you the unique option to combine hydraulic and AC thrusters in a single control environment.

All hydraulic systems are delivered ready-to-use to provide a straightforward installation and the highest degree of quality assurance.

We offer complete hydraulic systems. Scan QR code to learn more

Benefits

- Continuous use
- Controlled power
- Reliability
- S-Link™ operating system
- Custom-made, ready to install with Plug & Play wiring
- The choice of leading boatbuilders
- Full documentation
- DNV type approval for specific models
- Suitable for joystick and DP integration

TYPE APPROVED PRODUCT DNV DNV.COM/AF

Specific models

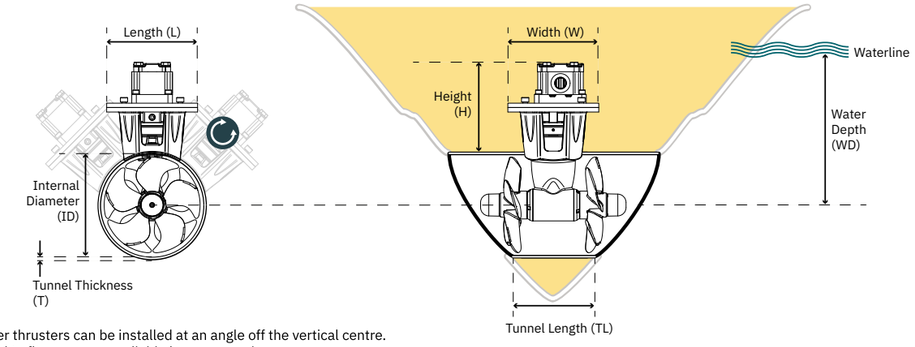
Product features

- S-LINK™
- SEALED DRIVE LUBRICATION
- GRAVITY FEED LUBRICATION
- Q-PROP™
- PRO™

Technical details

Ideal Vessel Class	Commercial
Ideal Vessel Size	9–55 m / 30–175 ft
Power	HYD
Thrust light duty	100–1100 kg/220–2425 lbs
Thrust heavy duty	80–1400 kg/176–3085 lbs
Tunneldiameter	185–610 mm
Placement	Bow / Stern

	For light usage				
	SH 100/185 T	SH 160/215 T	SH 240/250 TC	SH 320/300TC	SH 360/300 TC
Light duty thrust (kg)	100	160	240	320	-
Heavy duty thrust (kg)	80	140	220	270	360
Ideal Vessel Size (m/ft)	9-16/30-34	11-19/35-62	13-23/42-75	13-23/42-75	18-33/59-108
Power Output (kW • Hp)	6.9 • 9.3	10.0 • 13.4	14.9 • 20	17.4 • 23.3	27 • 37
Q-PROP™	Yes	Yes	Yes	Yes	Yes
Propulsion system	Twin	Twin	Twin Counter	Twin Counter	Twin Counter
Lubrication	Sealed	Sealed	Sealed	Sealed	Gravity feed

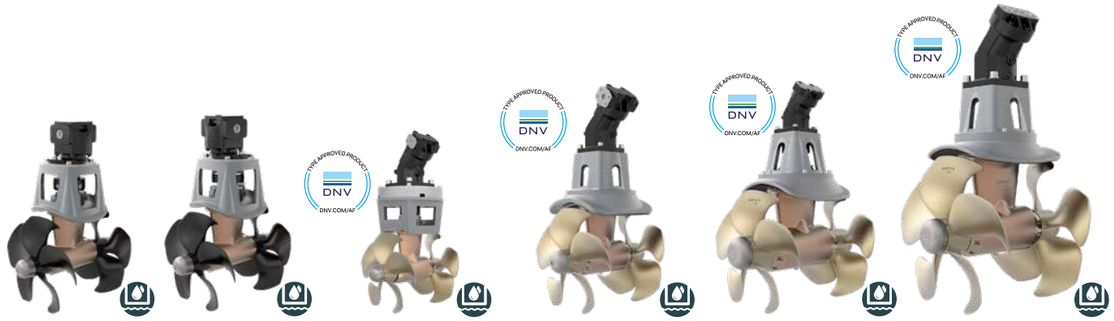


Sleipner thrusters can be installed at an angle off the vertical centre.
Tailored to fit any space available in your vessel.

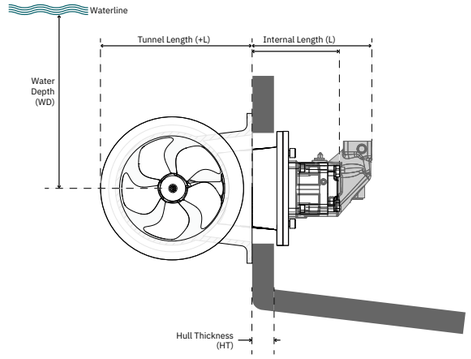
Bow	SH100/185T	SH 160/215 T	SH 240/250 TC	SH 320/300TC	SH 360/300 TC
(ID) Internal Diameter (mm)	185	215	250	300	300
Weight[1] (kg)	7.8	11.4	13.5	17.16	26
(H) Height (mm)	215	195	235	245	356
(L) Length (mm)	203	203	203	258	258
(W) Width (mm)	203	203	203	258	258
(ID) Internal Diameter (mm)	185	215	250	300	300
(WD) Water Depth (mm)	200	215	250	300	450
(TL) Rec. Tunnel Length (mm)	340	560	600	550	550
(TL min.) Minimum Tunnel Length (mm)	170	280	300	370	370
(T min.) Min. Tunnel Wall Thickness (mm)	4	6	7	10	10

Stern	SH100/185T	SH 160/215 T	SH 240/250 TC	SH 320/300TC	SH 360/300 TC
(L) Internal Length (mm)	405	172	912	195	310
(+L) Tunnel Length (mm)	705	300	340	420	420
(WD) Stern Water Depth (mm)	770	215	250	300	300
(HT) Maximum Hull Thickness (mm)	120	54	60	60	60
Stern thruster kit	90086i	90135i	90140i	90200i	90350
Cowls - short model	90075	-	-	-	-
Cowls - long model	90077	90136	90132	90220	-

Please see note regarding thruster power and battery rating on page 114.
[1] Weight stated include thruster, props & bellhousing ONLY.
Weight of hydraulic motor comes in addition

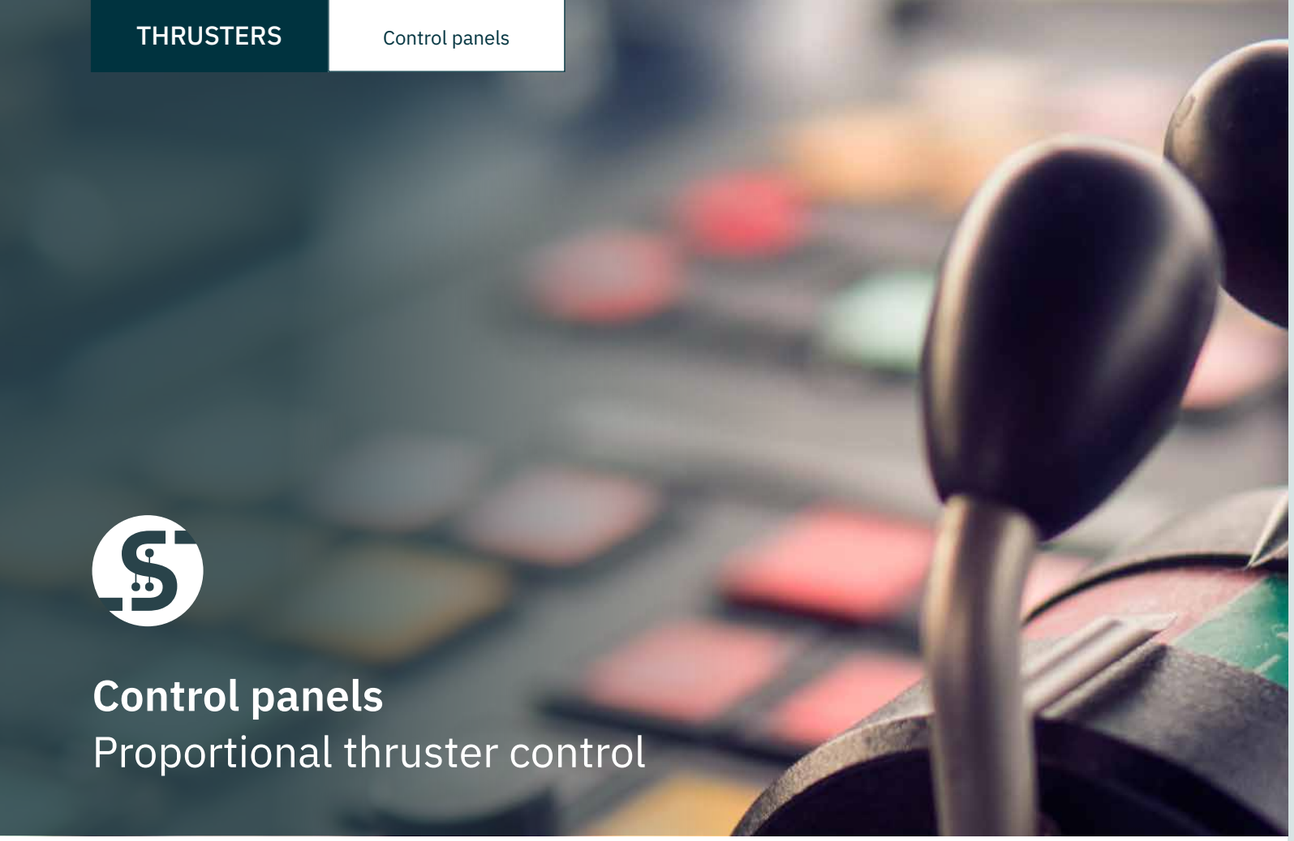


For light usage		For heavy duty usage			
SH 420/386 TC	SH 550/386 TC	SH 400/300	SH 700/412	SH 1000/513	SH 1400/610
-	550	-	-	1100	-
420	500	400	700	1000	1400
22-35/75-110	25-40/85-140	18-33/59-108	29-44/95-145	30-45/100-150	40-55/130-175
31.8 • 42.6	39.9 • 53.5	30 • 41	43.4 • 58.2	59.8 • 80.2	80.1 • 107.4
Yes	Yes	Yes	Yes	Yes	Yes
Twin Counter	Twin Counter	Twin Counter	Twin Counter	Twin Counter	Twin Counter
Gravity feed	Gravity feed	Gravity feed	Gravity feed	Gravity feed/On water change	Gravity feed/On water change



SH 420/386 T	SH 550/386 T	SH 400/300	SH 700/412	SH 1000/513	SH 1400/610
386	386	300	412	513	610
46	56	31	72–76	168–182	211
369	369	356	450	486	500
268	268	258	268	398	398
268	268	258	268	398	398
386	386	300	412	513	610
580	580	450	620	750	900
750	750	550	800	1000	1000
500	500	370	550	750	750
10	10	10	16	16	18

SH 420/386 T	SH 550/386 T	SH 400/300	SH 700/412	SH 1000/513	SH 1400/610
257	257	305	n. a.	405	470
540	540	422	n. a.	705	820
380	380	300	n. a.	770	915
54	54	60	n. a.	120	145
90550	90550	90350	90700	91000	91400
-	-	n. a.	n. a.	n.a.	n.a.
90560	90560	n. a.	n. a.	n.a.	n.a.



Control panels
Proportional thruster control

PJC2 series

Single or dual joystick with integrated LCD display

- Fingertip control with purpose-designed joysticks
- Hold function enables to set and leave the level of thrust
- Compact design
- Backlit LCD with instant feedback:
  - System status and diagnostics
  - Indication of power and direction of thrust
  - Interactive multi-language menus
- S-Link™ CAN-bus communication
- Built-in alarm buzzer
- Connector for external alarm buzzer
- Plug & Play cables, waterproof and compact connectors
- Supports all Sleipner retractable thrusters
- Supports Vector Fins™ on/off control

Control panel	PJC211	PJC212	PJC221	PJC222
Control panel DNV Design Approved*	N/A	N/A	N/A	N/A
For thruster type	DC/AC	DC/AC	DC/AC/HYD	DC/AC/HYD
Display	Integrated	Integrated	Integrated	Integrated
Height (mm)	141	141	141	141
Width (mm)	83	83	83	83
S-Link™ CAN-Bus	Yes	Yes	Yes	Yes
Multi-voltage	Yes	Yes	Yes	Yes
Child safety	Yes	Yes	No	No
Stop function	No	No	Yes	Yes
Thruster operation	Single	Dual	Single	Dual
Joystick type	Spring, hold-button	Spring, hold-button	Spring, hold-button	Spring, hold-button

*Only available for thruster models with DNV approved gear house

PJC4 series

Single or dual joystick with stand-alone color LCD display. The bright 3,5" daylight touch screen with an intuitive interface offers an easy day-to-day operation.

- Back-lit touch color LCD with instant feedback:
  - System status and diagnostics
  - Indication of power and direction of thrust
  - Interactive multi-language menus
- IPX7 water ingress rated control panel
- Flush or top mount control panel (HxW: 149x112mm)
- Built-in Wi-Fi module - future ready
- S-Link™ CAN-bus communication
- Built-in alarm buzzer
- Plug & Play cables, waterproof and compact connectors
- Dedicated connector for IO signals
- Supports various joystick designs

Environmental testing

- DNVGL-CG-0339:2019
- IACS E10:2018
- IEC 60945
- IEC 60092-504:2016

NEW 2021

TP-35

DNV design approved product variant for all available joystick types

- Power supply fault monitoring
- Display of propeller RPM
- Gearleg low oil level monitoring
- Select station, command transfer between multiple operator stations

The PJC4 package consists of joystick of choice and TP-35 control panel.

PJC421-PVREL	PJC422-PVREL	PJC421-LE90	PJC422-LE90	PJC421-LF90X	PJC422-LF90X	PJC421-LF90	PJC422-LF90
PJC421-PVREL-DNV	PJC422-PVREL-DNV	PJC421-LE90-DNV	PJC422-LE90-DNV	PJC421-LF90X-DNV	PJC422-LF90X-DNV	PJC421-LF90-DNV	PJC422-LF90-DNV
DC/AC/HYD	DC/AC/HYD	DC/AC/HYD	DC/AC/HYD	DC/AC/HYD	DC/AC/HYD	DC/AC/HYD	DC/AC/HYD
Stand-alone	Stand-alone	Stand-alone	Stand-alone	Stand-alone	Stand-alone	Stand-alone	Stand-alone
123,4	206,0	96,0	96,0	96,0	96,0	96,0	96,0
105,5	106,0	96,0	96,0	96,0	96,0	96,0	96,0
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No	No	No	No	No	No	No	No
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Single	Dual	Single	Dual	Single	Dual	Single	Dual
Spring, twist detent	Spring, twist detent	Detent	Detent	Detent	Detent	Detent	Detent

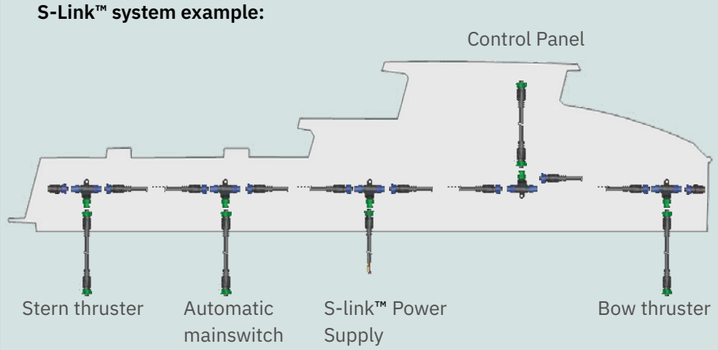
S-Link™

S-Link™ is a CAN-bus based control system with full intelligent communication between all units in the system, much like a computer network. The system saves precious installation time as you can control DC, AC or Hydraulic thrusters, Stabilizers, Hydraulic Power Systems, control panels, joysticks, and various interfaces and automatic main switches all on the same network.

Advantages

- Round, compact and waterproof plugs with unique keying and color coding to avoid faulty hookup
- Unlimited number of commands or information transfer on a single cablel
- User feedback to panel
- Intelligent troubleshooting

S-Link™ system example:



S-Link™ system example

S-Link™ system with two control positions and a dual PRO™ thruster setup (bow and stern)

Depending on the boat's construction, there might be several different ways to route the S-Link™ backbone. Find the most practical way to implement the backbone and remember that the S-Link™ equipment does not need to be connected in a specific order.

Item code	Description	Parts
6 1320-xx	Backbone cable	4 pcs
6 1321-xx	Spur cable	4 pcs
6 1326	T connector	5 pcs
6 1328	Power cable	1 pc
6 1327	End terminator	2 pcs

S-Link™ cable components

Backbone cables

Forms the communication and power bus throughout the vessel. Available in different standard lengths.

Item code:
6 1320-xxM (xx=length)
6 1320-0.2M (0.2m)
6 1320-2M (2.0m)
6 1320-4M (4.0m)
6 1320-7M (7.0m)
6 1320-10M (10.0m)
6 1320-15M (15.0m)
6 1320-20M (20.0m)

Spur cables

Used to connect S-Link™ compliant products to the backbone cable. One SPUR Cable must be used for each connected component, with no exceptions. Recommended to be as short as practically possible. Available in different standard lengths.

Item code:
6 1321-xxM (xx=length)
6 1321-0.4M (0.4m)
6 1321-1M (1.0m)
6 1321-3M (3.0m)
6 1321-5M (5.0m)

Power cable

Required in all installations for connection of BACKBONE cable to a power supply. It shall not be more than one POWER cable in an installation. Length: 2,5 m.

Item code: 6 1328

End terminator

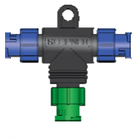
Must be one at each end of the BACKBONE bus.

Item code: 6 1327

Backbone extender

Connects two BACKBONE cables to extend the length.

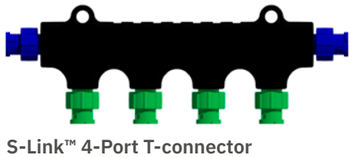
Item code: 6 1322



T connector

Used for connection of SPUR or POWER Cable to the BACKBONE Cable. One T-Connector for each connected cable.

Item code: 6 1326



S-Link™ 4-Port T-connector

Allows four spur cable connections in the same devic for a more tidy installation with fewer parts. Two sealing caps included for protection.

Item code: 6 1403

Accessories S-Link™ system

Voyage Data Recorder Interface

The VDRI-1 acts as a gateway between the Sleipner S-Link™ bus and a Voyage Data Recorder (VDR) NMEA0183 interface. VDRI-1 is compliant with SOLAS' and IMO's VDR requirements.

VDRI-1	
H (mm)	43,2
W (mm)	121,2
D (mm)	96

Thruster Monitoring Unit

The TMU-1 makes additional thruster information available on the S-Link™ bus. RPM of the thruster motor and gearleg low oil level alarm can be made available on Sleipner's PJC4 control panels by interfacing the thruster with TMU-1. This requires an RPM sensor on the thruster motor and a connection of Sleipner's 2.5 litres oil tank kit to the gearleg.

TMU-1	
H (mm)	43,2
W (mm)	121,2
D (mm)	96

Oil tank kit for thruster 2.5 litres

Connecting the external oil tank to the gearleg enables on-water oil change on selected models.
By interfacing the oil tank's built-in level switch to TMU-1, S-Link™ control panels supporting TMU-1 can generate low-level alarms.

S-Link™ Interface

S-Link™ interface to connect footswitch, control panel and radio remote to the S-Link™ system (foot switch, panel and remote not included). Multivoltage 12/24V.

S-Link™ Interface 8730 B / 8730 S	
H (mm)	45
W (mm)	80
D (mm)	145
Item code bow thruster	8730 B
Item code stern thruster	8730 S

Gateway

The GW-1 gateway is used to interface NMEA2000 devices and Sleipner's S-Link™ system. The gateway can also be used to interface NMEA 0183 compliant GPS products, enabling S-Link™ products to receive GPS time and position data. Manufacturer can apply for access to parts of Sleipner's S-Link™ protocol, allowing 3rd party products to monitor and control Sleipner's S-Link™ thrusters and stabilizer systems.

GW-1	
H (mm)	26
W (mm)	50
D (mm)	127

External Signal Interface

The ESI-1 External Signal Interface is used to interface digital IO signals and Sleipner's S-Link™ system. Two analog 4-20mA inputs offer proportional control of S-Link™ compliant bow and stern thrusters. Digital IOs are available for control and feedback signals.

ESI-1	
H (mm)	156
W (mm)	212
D (mm)	62

Foot switch

Foot switch kit suitable for 8730 S-Link™ interface. Kit contains 2 switches with covers to protect from unwanted operation.
(Cables from switches to 8730 S-Link™ interface not included).

Foot Switch	
Diameter (mm)	105
Item code (kit)	8751

Hydraulic power systems

Sleipner’s hydraulic power systems are designed for ultimate flexibility to support all hydraulic components onboard, including thrusters and stabilizers. A hydraulic system offers immense savings on space and labor cost, considering that essentially all necessary parts are pre-installed, wired, and adjusted.

A hydraulic system makes sound economic sense for many vessels as several functions can run off one central hydraulic source. Once the primary system is in place, including the pump, reservoir, and cooler, adding a function is simply a matter of adding a relatively inexpensive hydraulic valve. This approach is more efficient and cost-effective than running each part with its own electric motor, solenoid, fuse, and battery switch, especially with larger equipment.

Hydraulic valves and motors are better choices in harsh environments such as the forepeak, bilge, and transom areas and areas requiring ignition protection. Typical hydraulic applications are thrusters, stabilizers, winches, capstans, cranes, and so on.

For all the hydraulic components to be compatible and maintain the same high quality, Sleipner offers complete hydraulic systems with guaranteed performance. Sleipner hydraulic systems use only brand-name hydraulic components, ensuring reliability and easy worldwide access to spare parts and service.

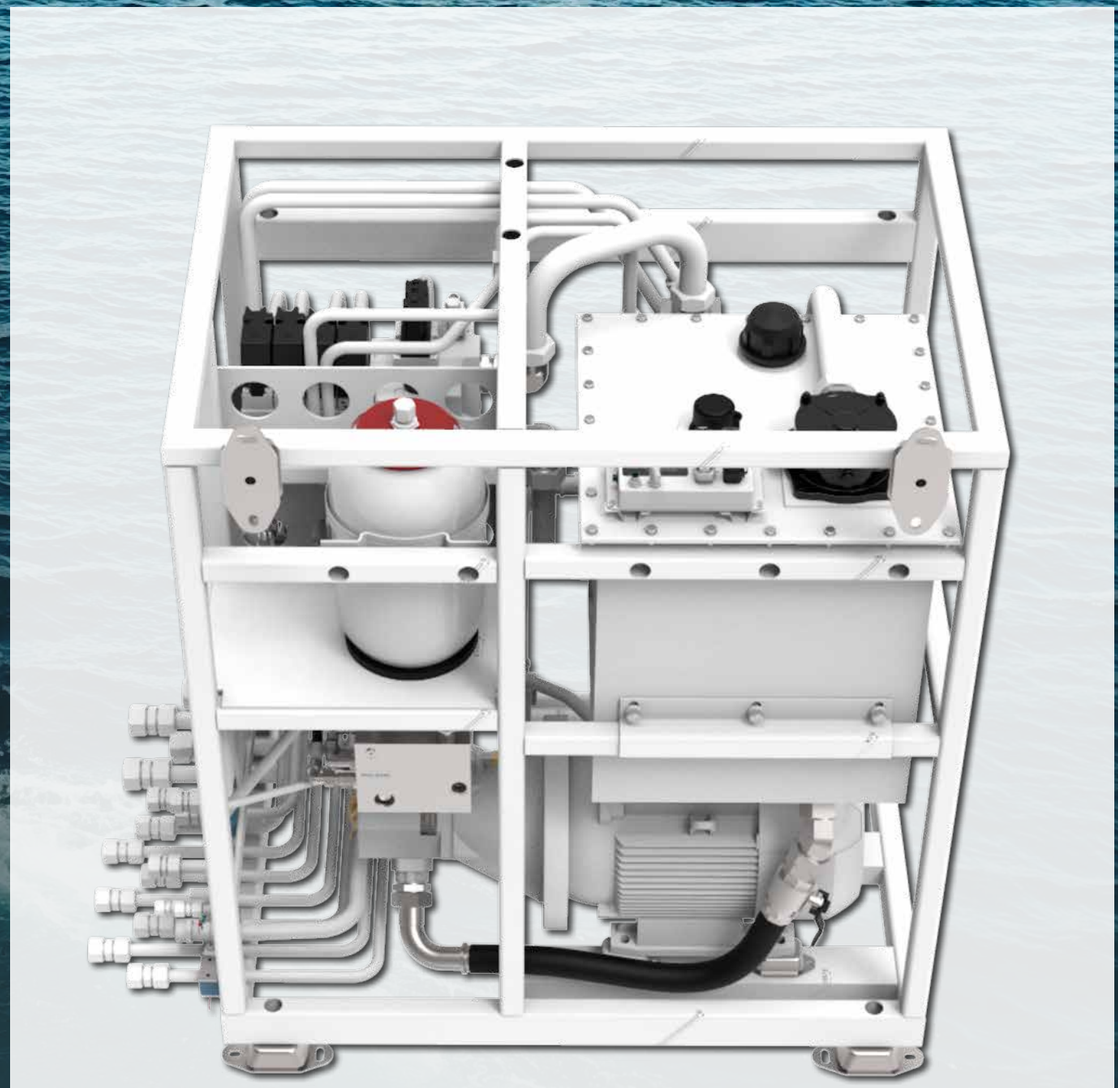
The hydraulic pumps are based on the well-proven and reliable load sense principle, ensuring high efficiency, low noise, and low heat generation.

The system’s brain is the PHC-3 with real-time component diagnostics on both the integrated LCD panel and at the helm. Installed directly on the tank, it provides below deck access to diagnostics and local configuration of parameters.

All hydraulic systems are delivered ready-to-use to provide a straightforward installation and the highest degree of quality assurance.

Benefits

- Compact-sized units and easy maintenance
- Delivered pre-fitted with all components adjusted
- Advanced real-time diagnostics
- S-Link™ operating system
- Plug-and-go wiring
- Available as standard or customized by our hydraulic expert engineers
- Bulkhead and floor installation options
- Delivered with complete system-specific documentation
- Load sensing hydraulic pumps for optimal efficiency
- Easy firmware update through S-Link™



Product features

- HYDRAULIC
- S-LINK™
- DIAGNOSTIC MONITORING

Technical details

Ideal Vessel Class	Commercial
Ideal Vessel Size	9–55 m / 30–175 ft
Power Source	Main engine / Generator
Reservoir	Powder coated stainless steel
Placement	Bulkhead / Floor
Control Signal	S-Link™

Project engineering

Sleipner has been working in close partnership with leading boat builders for decades. Our in-house knowledge amongst our engineers represents more than 250 years of combined experience.

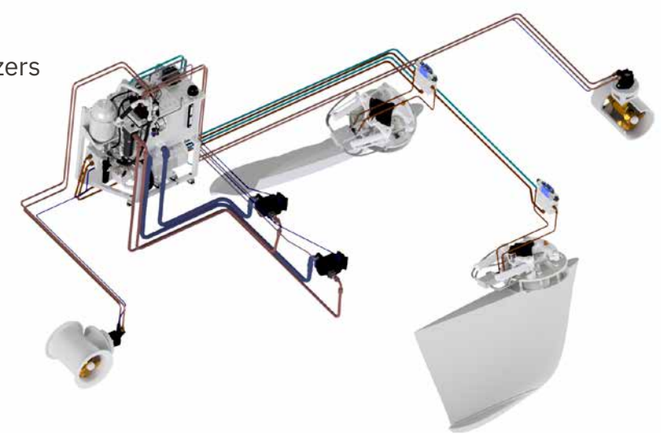
More than 4,000 vessels have been fitted with a Sleipner hydraulic system just in the last 20 years.

Scan the QR code below to see our commercial reference list for a small selection of our deliveries.

> We have always worked passionately to create a safer, more comfortable experience at sea. Our products continue to be a benchmark for the boating industry.
>
> *Tore Eriksen, Chief Technical Officer*

Main services

- Complete designs for thrusters, stabilizers and hydraulic power systems
- 3D modelling
- Calculations
- System specific documentation
- Type approvals / certifications
- On board system set up / training



A reliable partner

- In-house engineering, manufacturing and assembly
- Engineering assisted by extensive experience
- Use of superior materialsControlled quality of every supplied part
- Only high quality brand components
- Worldwide product support
- 2-year limited warranty

Robust and reliable steering comfort

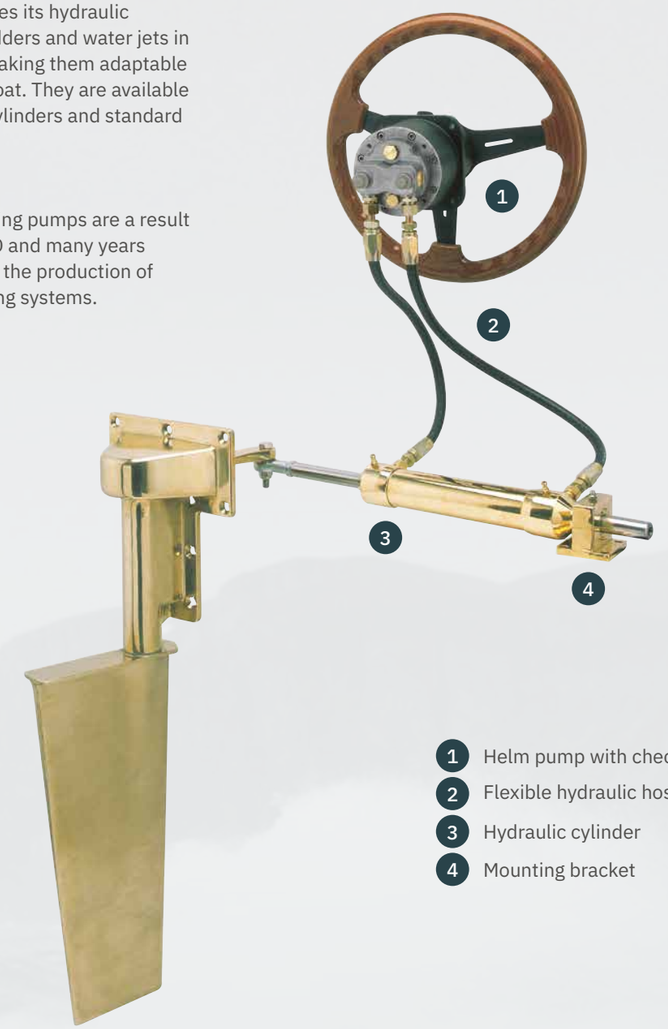
Close collaboration with boatbuilders and shipowners has allowed Sleipner to develop robust hydraulic steering systems for the professional market. You can easily select the best-suited equipment for your boat's specific needs within a wide range of pumps, cylinders, and accessories made from marine-resistant materials.

Advantages

- Safer and more precise control of your vessel
- An integrated non-return valve helps the rudder maintain its position without holding the steering wheel
- Minor mechanical wear means minimal maintenance and extended product-life
- Best alternative if you want two or more steering positions
- Stable course with minimal use of force

Cylinders
Sleipner produces its hydraulic cylinders for rudders and water jets in various sizes, making them adaptable to almost any boat. They are available as heavy duty cylinders and standard cylinders.

Steering Pump
Sleipner's steering pumps are a result of intensive R&D and many years of experience in the production of hydraulic steering systems.



1. Helm pump with check valve
2. Flexible hydraulic hose
3. Hydraulic cylinder
4. Mounting bracket

Certification

Heavy Duty Cylinders
DNV type approved

Standard Cylinders
Approved by the Norske Veritas for Recreational Boats.

Technical details

Ideal Vessel Class	Commercial
Steering Positions	Multiple
Standard Cylinder	110–565 cm^3 / 50 bar
Heavy duty Cylinder	1111–1187 cm^3 / 70–85 bar
Helm Pumps	26, 35, 43, 70 cm^3
Helm pump installation	Flange, flush, tilt

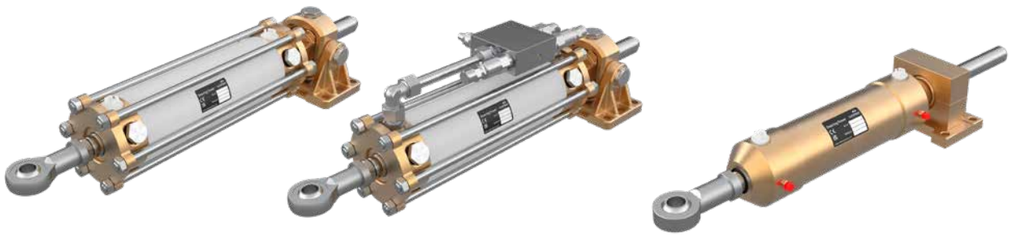
Hydraulic cylinders

Sleipner’s hydraulic cylinders fit a wide range of installations. They are adaptable to most rudders and water jets as long as the rudder torque does not exceed what the cylinder is intended for.

Finding the right cylinder

Rudders
To find the proper steering for boats with rudders, you must calculate the rudder torque. The calculation formula can be found under technical details in the cylinder’s product information.

Pump Jets
For water jets and other types of installations, please contact a Sleipner dealer that can assist you.



Heavy Duty Cylinders
Our series of heavy-duty cylinders are designed to deliver maximum performance and reliability for our power steering systems. Still, several of the cylinders are equally suitable with a traditional hydraulic steering pump. Teflon gaskets of the highest quality provide a smooth ride with minimal friction and maintain high pressure.

- Three sets of connection ports allow for installation of an optional shock and by-pass valve
- DNV Type approved

Standard Cylinders
Sleipner’s standard cylinders are of very high quality and are in use in thousands of boats. The cylinders are proven and have a very long service life.

- Robust construction in stainless steel and brass
- Long lifetime
- Easy air purging
- Supplied with attachment nipples
- Approved by the Norwegian Veritas for Recreational Boats

TYPE APPROVED PRODUCT DNV DNV.COM/AF

Learn more at our blogg
or at our website.

Hydraulic steering pumps

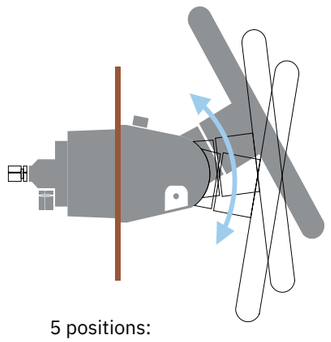
The steering pump is the heart of a hydraulic steering system. This component decides how much oil to pump through to the system’s muscle which is the cylinder.

Sleipner offers three different models for different boats and dashboard designs.
All three models are available in 26 cm³, 35 cm³ and 43 cm³ for adaption to different hydraulic cylinders, or the desire to choose a steering wheel mandrel.

Additionally, we have a more extensive steering pump of 70 cm³, which has 10 pistons. This pump is mainly used together with our largest cylinder, only available as a recessed model.

DNV EN30592

- Axial piston pump with fine-tuned piston angles
- Seven pistons for smooth and precise steering
- Piston in hardened steel
- Stable and rigidly mounted acid-resistant steering shaft with four ball bearings
- Integrated non-return valve
- Large internal oil reservoir
- All parts in corrosion-free materials



5 positions:
-10°, 0°, 10°, 20 , 30°

Item code: WH28SS
Constructed material: Stainless steel
Diameter: 28 cm

Helm pump with flange

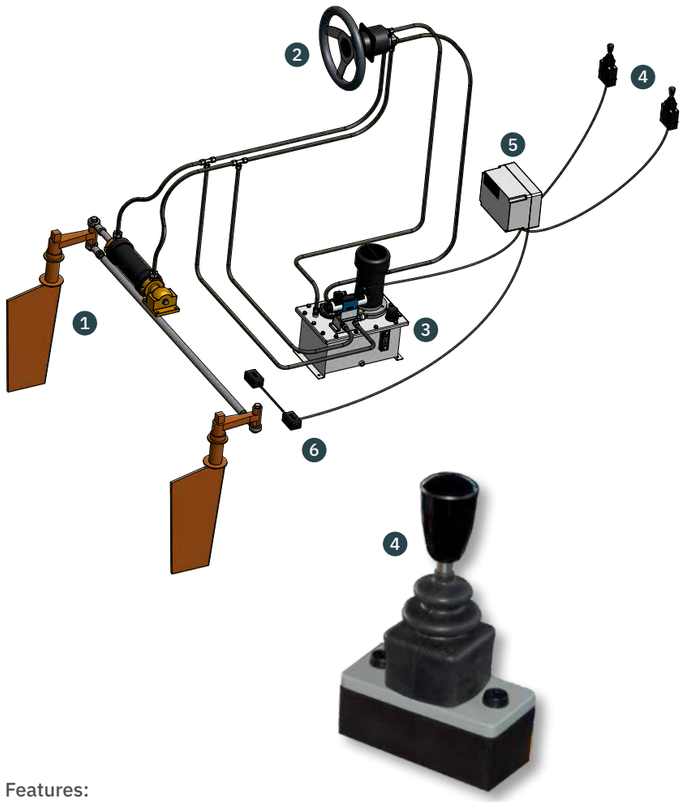
Helm pump with flush mount

Helm pump with tilt

Hydraulic Unit PS600

PS600 is a robust power steering for commercial vessels. Sleipner has designed a control with a constantly running electro-hydraulic pump and valve for connecting the autopilot and joystick. To ensure long life and high operational reliability, an adjustable auto-stop function is built into the control unit which significantly reduces the running time of the pump and motor. Automatic end stops are an important feature to reduce the load and stress on the system.

The system maintains Sleipner quality and can also be expanded with manual hydraulic steering pumps.



The Power steering system includes the following:

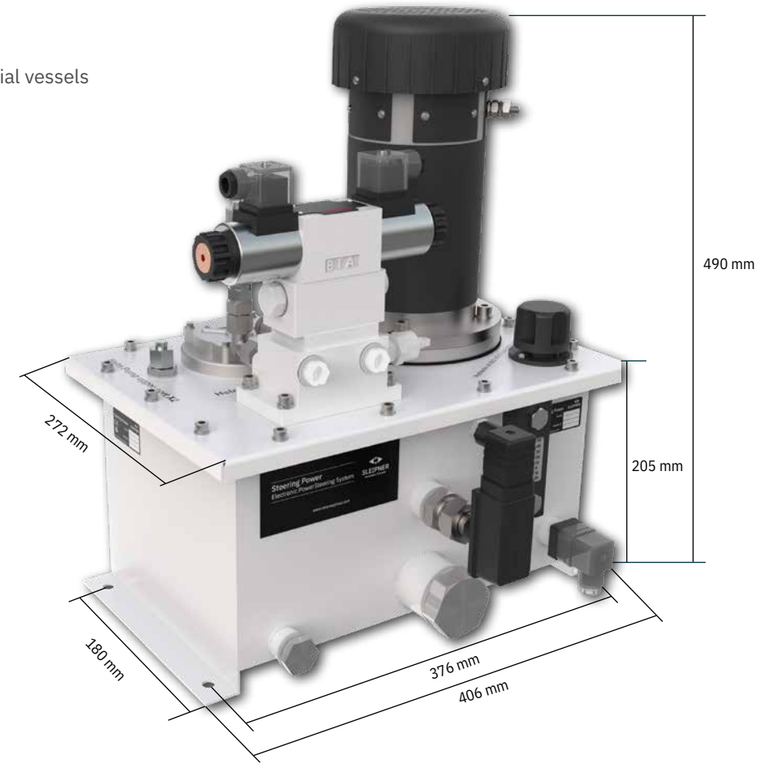
1. Hydraulic steering cylinder
2. Hydraulic helmpump
3. Hydraulic power unit consists of electric motor, hydraulic pump, oil filter, valve system and oil
4. Joystick, one or two
5. Electronic control unit handling signals from joystick, autopilot and rudder stop switches. Outputsignals from the control box controls starboard and port directional valves and the motor starter relay
6. Rudder end stop switches
7. Optional level and temperature sensor

Features:

- Compact oil tank with return filter, pump, valve and electric motor
- Fits steering cylinder volume from 345cm³ to 1200cm³
- When using autopilot, no external pump is required
- Auto stop function on electric motor
- 600W / 24V electric motor
- Selectable pump of 7.0, 4.5 or 3.3 liters per. minute
- Prepared for joystick, autopilot and manual control
- 240 / 400V AC

Contact Sleipner for more information.

- Robust power steering for commercial vessels
- Constant running pump
- Auto-stop function
- Automatic end stop
- Compact construction



Item code				Pump volume**	Cylinder art. no	Volume	Time from port to starboard
		Input power					
24C DC	230/400V 3-phase	24V DC	230/400V 3-phase				
		With temperature and level switch					
74352				3,2 liters per min	71140	345 cm3	6,5 sec*
74352				3,2 liters per min	71220	565 cm3	7,9 sec
74351				4,3 liters per min	71220	565 cm3	7,9 sec
74351				4,3 liters per min	71140 x 2 stk	690 cm3	9,6 sec
74351				4,3 liters per min	9032-200-x	1111 cm3	14,0 sec
74350	74350-AC3	74350-S	74350-S-AC3	6,7 liters per min	71220	565 cm3	5,1 sec*
74350	74350-AC3	74350-S	74350-S-AC3	6,7 liters per min	71140 x 2 stk	690 cm3	6,2 sec*
74350	74350-AC3	74350-S	74350-S-AC3	6,7 liters per min	8032-200-x	844 cm3	7,6 sec
74350	74350-AC3	74350-S	74350-S-AC3	6,7 liters per min	9032-200-x	1111 cm3	9,9 sec

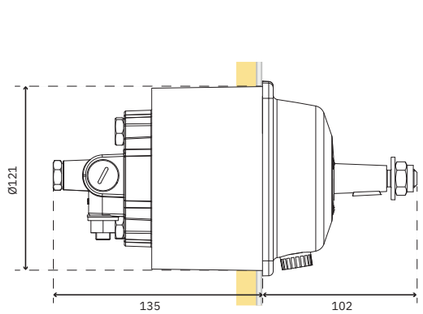
24V systems supplied with starting relay
** This stop-stop times may be to short for autopilots*
*** Pump volume for DC systems valid @ 27V.*

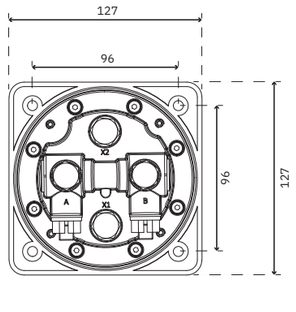
Item code	
74363	Control unit for PS600 with limit switches
10 2209	Joystick

Helm pumps 26–43 ccm

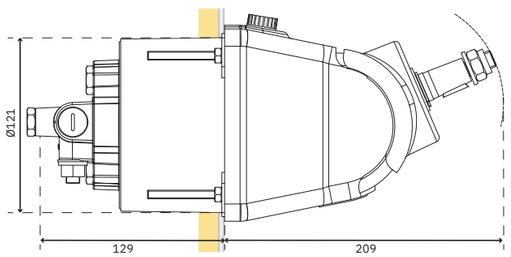
Item number 72061–72069

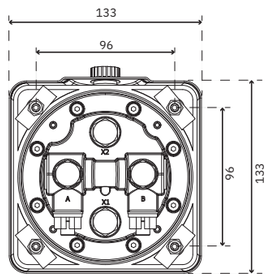
Helm pumps with flange



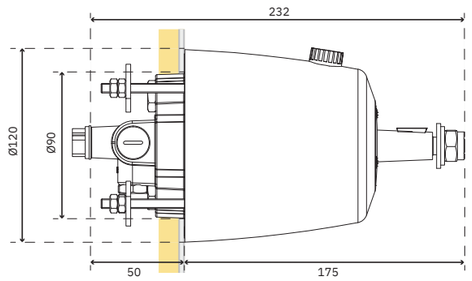


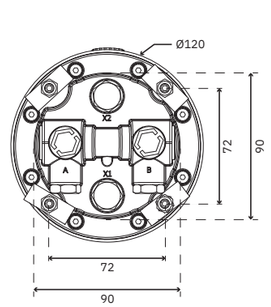
Helm pumps with flange and tilt





Helm pumps flush mount

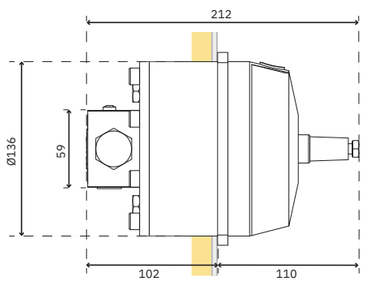


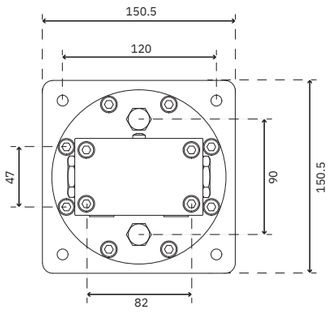


Helm pump 70 ccm

Item number 72070

Helm pumps with flange





Item code	Port Flange Thread	Helm pump	Port dimensions BSP A/B	x1/x2
72061	26 ccm	with flange	1/4”	1/4”
72062	35 ccm	with flange	1/4”	1/4”
72063	43 ccm	with flange	1/4”	1/4”
72064	26 ccm	with tilt	1/4”	1/4”
72065	35 ccm	with tilt	1/4”	1/4”
72066	43 ccm	with tilt	1/4”	1/4”
72067	26 ccm	flush mount	1/4”	1/4”
72068	35 ccm	flush mount	1/4”	1/4”
72069	43 ccm	flush mount	1/4”	1/4”
72070	70 ccm	with flange	3/8”	1/4”

Hose coupling, 90°

T-coupling

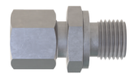
By-pass valve

Hydraulic oil

Meets ISO-VG-15, DIN 51524-3 HVLP specifications.

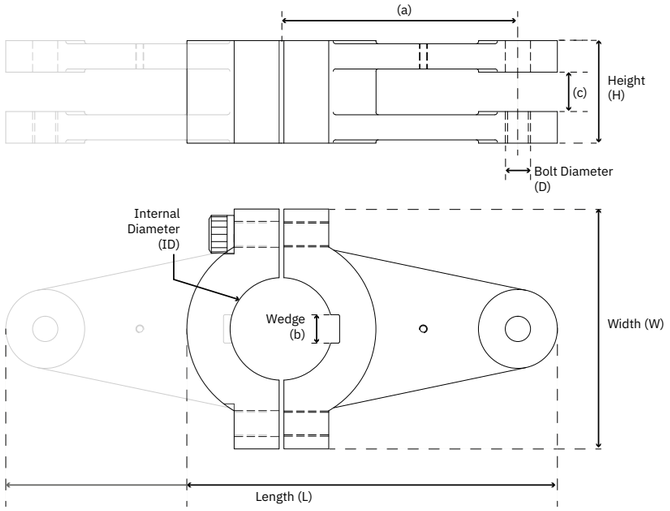
Hydraulic hose for steering

1 layer steel braided
Inner Ø: 9,5 mm (3/8”).
Outer Ø: 12 mm
Meets DNV standard EN 30592



Union fitting

Description	Item code standard	Item code stainless
Union fitting 1/4”BSPx10mm	72200	72210
Hose coupling, 10mm for 3/8’’ hose	72335	72336
T-coupling for 10 mm	72500	73510
Hose coupling, 90°, 10 mm	72400	72410
Hydraulic hose for steering, 3/8” 1 layer steel braided	72135	
Hyd. hose for steering, PA/11 2004, non pressure ventilation hose	72140	
By-pass valve 10 mm	72600	
By-pass valve 12 mm	72612	
Hydraulic oil for steering, 1 ltr	72750	
Hydraulic oil for steering, 12 pack (12x1 ltr)	72760	
Hydraulic oil for steering, 2,5 ltr	72700	



Rudder tiller arm
Made of coated cast iron, available single or dual, for shafts of 40–80 mm diameter, length 215–345 mm, width 115-180 mm.

Contact us for more details and custom-made products.

Item code	Material	Description	For shaft ID	Size Group	(H) Height	(L) Length	(W) Width	(D) Bolt dia.	(ID)	(a)	(b)	(c)
72848	Coated cast iron	Single	40	1	55	215	115	14	40	150	14	22
72849	Coated cast iron	Dual	40	1	55	340	115	14	40	150	14	22
72844	Coated cast iron	Single	40	1	55	340	115	16	40	150	14	22
72847	Coated cast iron	Dual	40	1	55	215	115	16	40	150	14	22
72850	Coated cast iron	Single	45	1	55	215	115	14	45	150	14	22
72851	Coated cast iron	Dual	45	1	55	340	115	14	45	150	14	22
72836	Coated cast iron	Single	45	1	55	215	115	16	45	150	14	22
72837	Coated cast iron	Dual	45	1	55	340	115	16	45	150	14	22
72852	Coated cast iron	Single	50	1	55	215	115	14	50	150	14	22
72853	Coated cast iron	Dual	50	1	55	340	115	14	50	150	14	22
72838	Coated cast iron	Single	50	1	55	215	115	16	50	150	14	22
72839	Coated cast iron	Dual	50	1	55	340	115	16	50	150	14	22
72854	Coated cast iron	Single	55	2	64	235	150	16	55	150	18	26
72855	Coated cast iron	Dual	55	2	64	345	150	16	55	150	18	26
72856	Coated cast iron	Single	60	2	64	235	150	16	60	150	18	26
72857	Coated cast iron	Dual	60	2	64	345	150	16	60	150	18	26
72858	Coated cast iron	Single	65	2	64	235	150	16	65	150	18	26
72859	Coated cast iron	Dual	65	2	64	345	150	16	65	150	18	26
72860	Coated cast iron	Single	60	2	64	235	150	20	60	150	18	35

Measurements in mm

Rudder rotations and cylinder pump volume

Item code	26 ccm	35 ccm	43 ccm	70 ccm
71030*	4,2	3,1	–	–
71060	4,8	3,6	–	–
71090	8,3	6,1	5,0	–
71140	–	–	8,0	4,9
71220	–	–	–	8,1

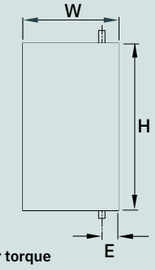
Item code	43 ccm	70 ccm
6525-200-xx	13,1	8,1
6530-200-xx	12,1	7,5
8032-200-xx	–	12,0
9032-200-xx	–	16,7
8032-305-xx	–	18,5

Recommended

Torque calculation formula

$V^2 \times H \times W \times ((B/2) - E) \times 6$

V = Top speed in knots
H = Rudder height in meters
W = Rudder width in meters
E = Compensation width in meters

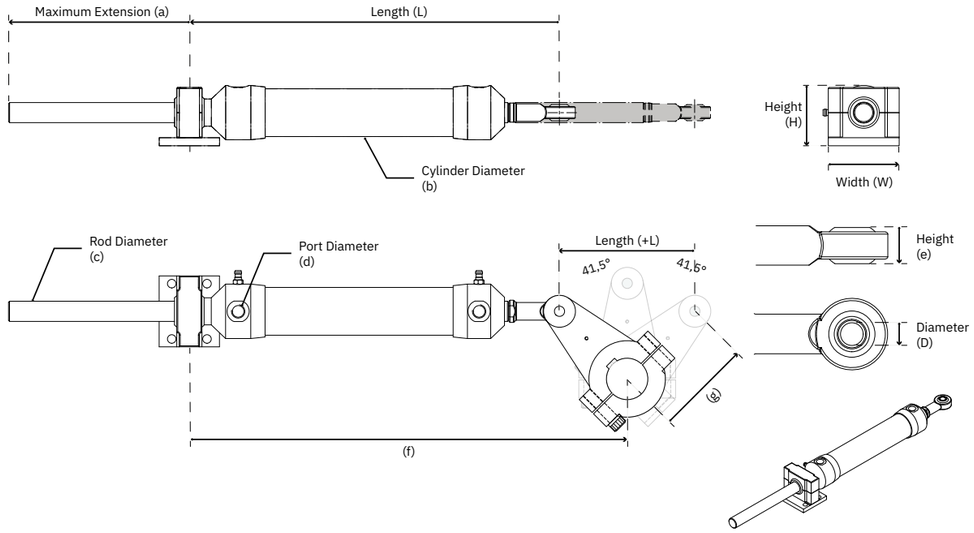


Example
V = 12 knots
H = 0,6 m
W = 0,5 m
E = 0,04 m

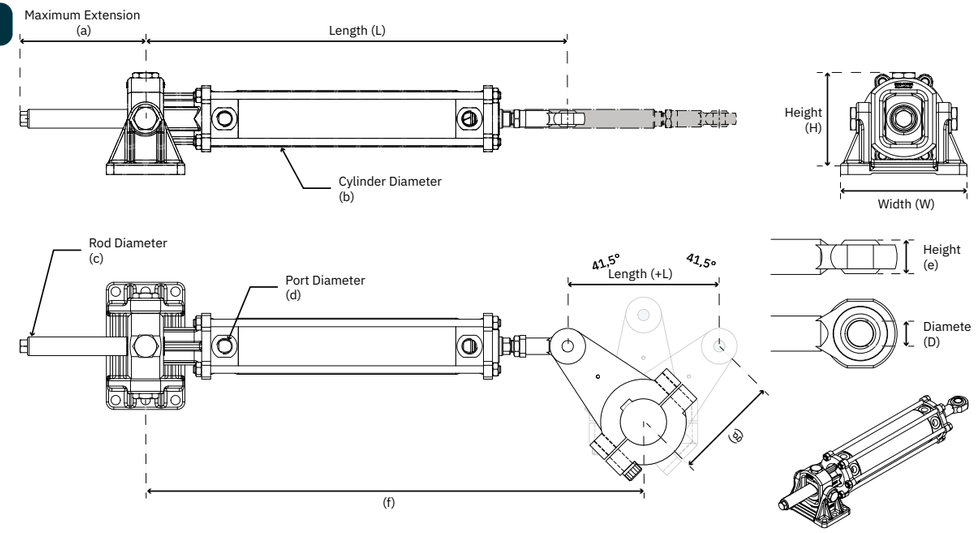
180 mm rudder tiller arm
122 x 0,6 x 0,5 x ((0,5 / 2) – 0,04) x 6 =
12 x 12 x 0,6 x 0,5 x 0,21 x 6 = **54,43 kgm rudder torque**
Based on the calculations in the above example, SP60 would be the preferred steering system.

150 mm rudder tiller arm (*multiply by 1,2)
122 x 0,6 x 0,5 x ((0,5 / 2) – 0,04) x 6 x 1,2 =
12 x 12 x 0,6 x 0,5 x 0,21 x 6 x 1,2 = **65,31 kgm rudder torque**
Based on the calculations in the above example, SP90 would be the preferred steering system.

STANDARD



HEAVY DUTY



Item code	Volume (ccm)	Max rudder torque (kgm) 150 mm tiller	Max rudder torque (kgm) 180 mm tiller	Working pressure (bar)	Recom. hose ID	Cylinder diam. (b) mm	Rod diam. (c)	Port dimension (d)	Max Extension (a)	Length (L)	(f)	Stroke length (+L)	(g)	Diameter (D)	Height (e)
Standard cylinder															
71030*	110	45 kgm	40 kgm	50 bar	3/8"	38	16	1/4"	158	337,5	425	175	150	12	150
71060	125	45 kgm	60 kgm	50 bar	3/8"	38	16	1/4"	180	355	460	200	150	12	150
71090	215	80 kgm	90 kgm	50 bar	3/8"	48	20	1/4"	180	365	465	200	150	12	150
71140	345	130 kgm	155 kgm	50 bar	1/2"	57	20	1/4"	165	392	492	200	150	14	150
71220	565	250 kgm	250 kgm	50 bar	1/2"	75	25	3/8"	175	350	520	200	150	16	150
71500	1170	500 kgm	500 kgm	50 bar	1/2”	100	25	M22x1,5	236	420	600	200	150	20	150
Heavy duty cylinder															
9032-200-7-60	1111	580	580	70	1/2”	100	32	1/2”	135	556	656	200	150	20	25
9032-200-7-70**	1111	580	580	70	1/2”	100	32	1/2”	135	556	656	200	150	20	25
8032-305-9-60	1287	-		85	1/2”	90	32	1/2”	240	679	832	305	-	25	20
8032-305-9-70**	1287	-		85	1/2”	90	32	1/2”	240	679	832	305	-	25	20

Measurements in mm

Contact Sleipner for more information and dimensioning.
*Rudder angle +/- 35° for Item code 71030.
**with shock and by-pass valve

Imprint

THRUSTER POWER
Sleipner states thrust power ratings at the typical voltage you can expect in a boat. 10.5V and 21V is the voltage most installations will be able to deliver to the thruster unit. For comparison reasons, we also list the thrust power rating at 12V and 24V.

BATTERY RATING
All battery CCA ratings are specified in DIN standard.
Multiply by 1.9 for the corresponding SAE rating at 0°F, ABYC standard.

Cold Cranking Amperes (CCA) is the amount of current a battery can provide at 0°F (-18°C). The rating refers to the number of amps a 12-volt battery can deliver at 0°F for 30 seconds while maintaining a voltage of at least 7.2 volts.

Contact your battery supplier or electrical engineer for technical details regarding batteries.

IMAGERY
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