SLEIPNER
*Ocean born. Tech bred.*

# Product Guide

## *Design and Installation Planning for SPS40E, SPS50E, SPS60E, SPS70E, SPS80E, SPS100E*


DOCUMENT ID: 7513
REVISION: 05
DATE: 2025
LANGUAGE: EN
ID

**Introduction**
This guide is made as a quick introduction and reference guide for designers and engineers with a good basic knowledge and understanding of boat building and good engineering practice. It does not cover all issues in all detail, and the complete installation manual contain more detailed information and should always be consulted for some details

**Stabilizer functions**
The fin stabilizers function is to reduce the roll of the boat, and how efficiently they can do this will depend on several factors.
This guide contain the major considerations om positioning the stabilizers for the efficiency, especially as relates to the revolutionary Vector Fin stabilizers that have some different priorities and features than traditional straight fin stabilizers.

**Installation planning**
Please follow this general guide and the installation manual for steps to prepare and plan your design and installation process:

Find the best possible position of the fins based on the information provided in the sections about:

- Safety and General precautions
- Measurements
  Please note the very flexible installation methods possible including off-set angle installation possible with Side-Power stabilizers as this might enable installation in positions more suited and efficient than possible with some other brands or types of fin stabilizers.
- Fin & actuator positioning
  ENSURE to have reasonably easy service access
- Hull forces
- Ensure that it is space to do the reinforcement of the hull

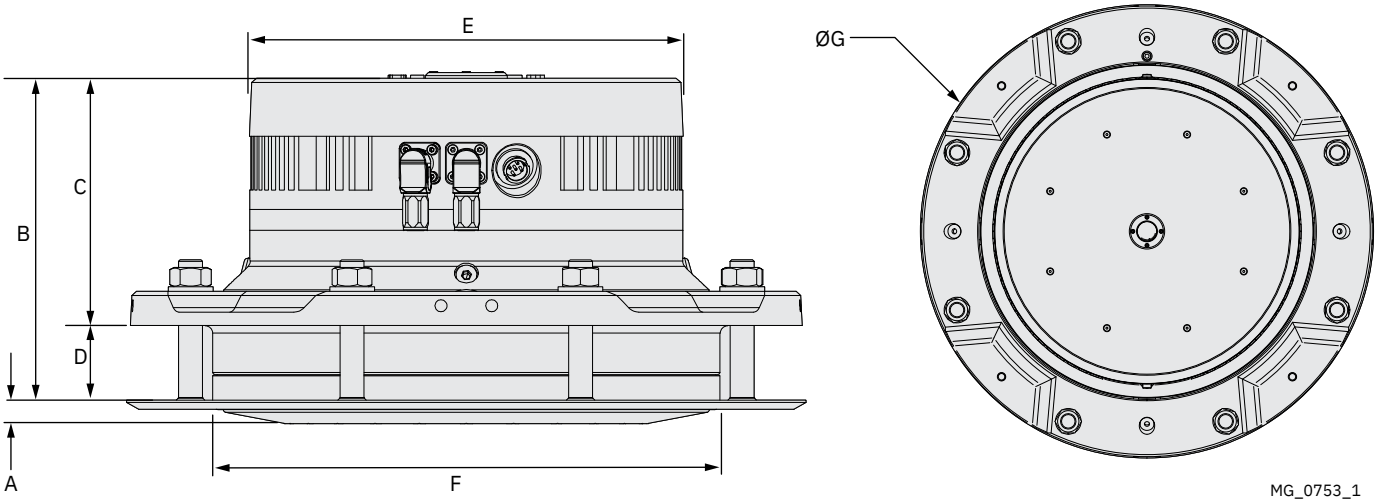
Plan the installation of the electrical parts including the control panel and wiring runs based on the information in the sections:

- Power supply
- S-link wiring
- Control panel installation

**eVision Actuator**

The electric drive component of the actuator system. The actuators are traditionally installed in the aft end of the living area or front section of the engine room. Due to the unique compact and low eVision design, installations require only minor modifications to the interior, if any. The actuators are also quiet so there is no problem to have in living spaces beneath the floor or furniture. They are available as both DC and AC versions.

| Dimension code | Dimension descriptions DC version | SPS40E | | SPS50E | | SPS60E | |
|---|---|---|---|---|---|---|---|
| | | mm | inch | mm | inch | mm | inch |
| A | Actuator height outside the hull | 15.8 | 0.6 | 15.8 | 0.6 | 16.8 | 0.7 |
| B | Total actuator height | 219.5 | 8.6 | 223.1 | 8.8 | 286 | 11.3 |
| C | Actuator height inside the hull | 169.5 | 6.7 | 171 | 6.7 | 226 | 8.9 |
| D | Hull thickness (sealant included) | 50 | 2 | 55 | 2.17 | 64 | 2.5 |
| ØE | Diameter of the actuator Motor | 290 | 11.4 | 310 | 12.2 | 345 | 13.6 |
| ØF | Diameter of the actuator through the hull | 340 | 13.4 | 361 | 14.21 | 407.5 | 16.0 |
| ØG | Diameter of the actuator base plate | 450 | 17.7 | 471 | 18.54 | 564 | 22.2 |
| | Weight (kg / lbs) | 65 / 143.3 | | 75 / 165.3 | | 120 /264.9 | |

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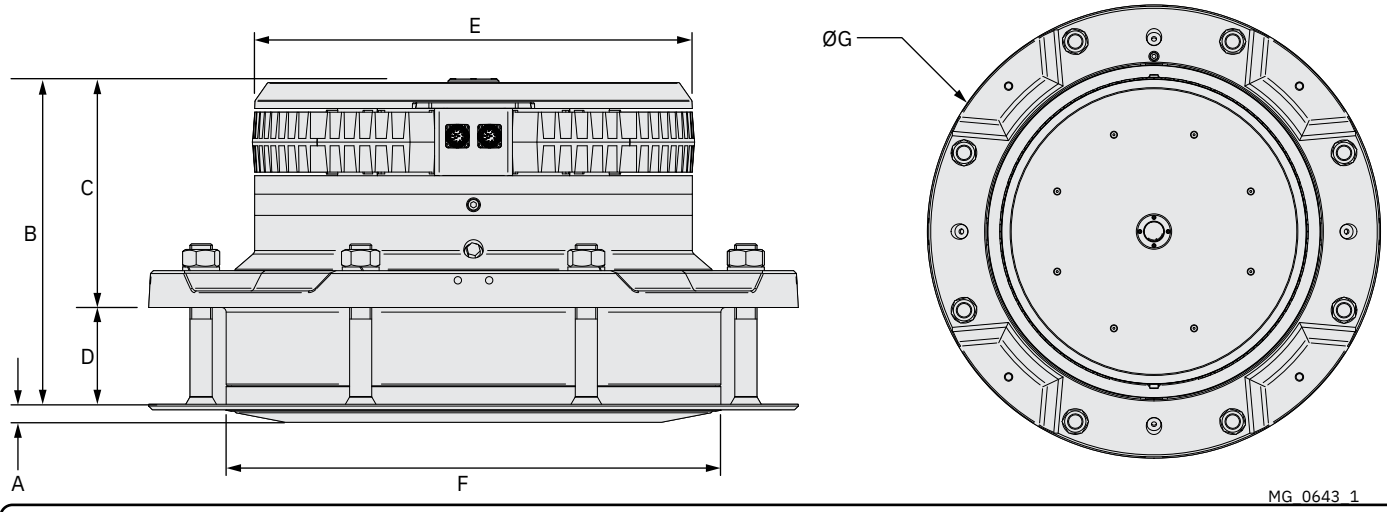
| Dimension code | Dimension descriptions AC version | SPS60E | | SPS70E | | SPS80E | | SPS100E | |
|---|---|---|---|---|---|---|---|---|---|
| | | mm | inch | mm | inch | mm | inch | mm | inch |
| A | Actuator height outside the hull | 16.8 | 0.6 | 16.8 | 0.6 | 20 | 0.8 | 23.5 | 0.9 |
| B | Total actuator height | 236 | 9.3 | 336 | 13.2 | 349 | 13.7 | 437.4 | 17.2 |
| C | Actuator height inside the hull | 172 | 6.8 | 256 | 10.1 | 249 | 10 | 287.4 | 11.3 |
| D | Hull thickness (sealant included) | 60 | 2.4 | 80 | 3.1 | 105 | 4.1 | 150 | 5.9 |
| ØE | Diameter of the actuator Motor | 350 | 13.8 | 405 | 15.9 | 475 | 18.7 | 559 | 22.0 |
| ØF | Diameter of the actuator through the hull | 408 | 16 | 457.5 | 18.0 | 537 | 21 | 629 | 24.8 |
| ØG | Diameter of the actuator base plate | 564 | 22.2 | 620 | 24.4 | 705 | 28 | 830 | 32.7 |
| | Weight (kg/lbs) | 118/260 | | 194/428 | | 296/653 | | 490/1080 | |

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# Actuator free space requirements

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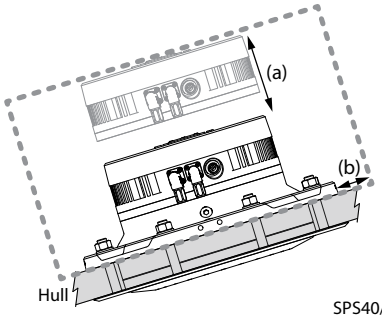
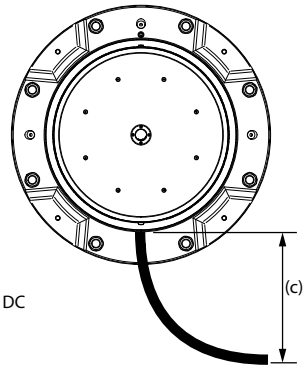
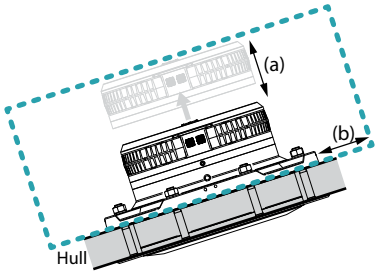
Consider and plan the positioning of the actuator for future service and appropriate area for cooling the electric motor. The ambient temperature is 40°C. The motor has temperature sensor and system will reduce power to avoid exceeding maximum allowed temperature.




SPS40/50/60E DC




SPS60/70/80/100E AC

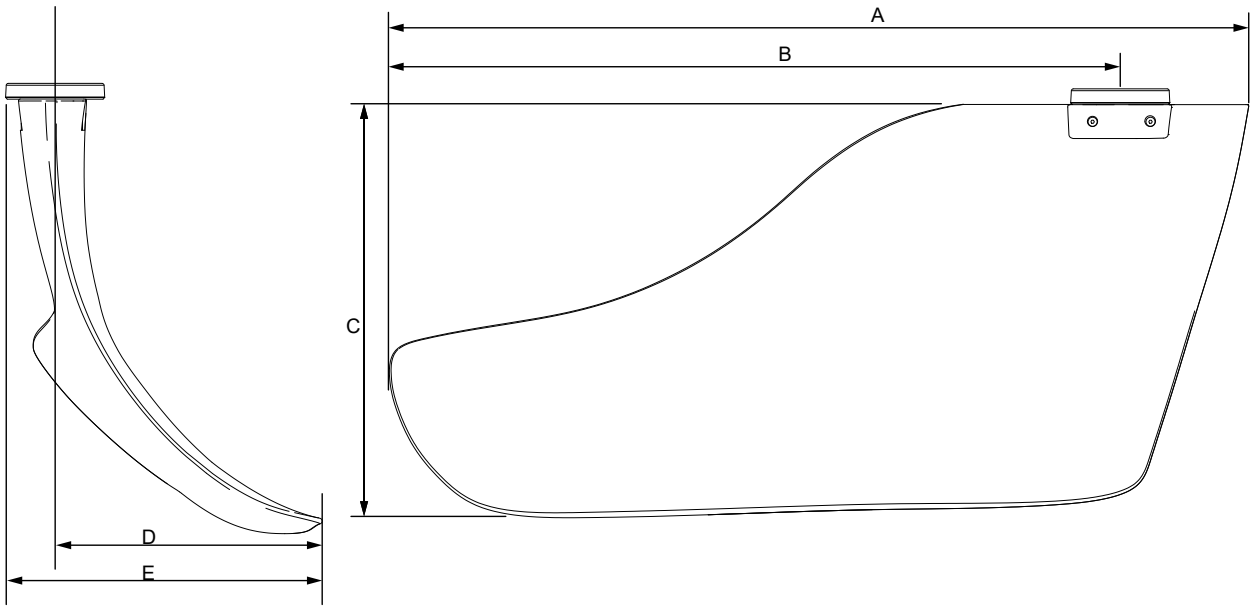
| Dimension code | Dimension description | SPS40/50E | | SPS60E | | SPS80E | |
|---|---|---|---|---|---|---|---|
| | | mm | inch | mm | inch | mm | inch |
| (a) | Free space for motor replacement | 100 | 3.9 | 185 | 7 | 250 | 10 |
| (b) | Base plate tooling clearance | 50 | 2 | 50 | 2 | 50 | 2 |
| (c) | 151713-xxx (SCU) minimum cable bend clearance | 200 | 7.9 | 200 | 7.9 | 200 | 7.9 |

**eVision Actuator Fin**
The 3rd generation Vector Fins™ are more efficient underway and at anchor. For faster boats the lift from the fins results in improved fuel efficiency compared to flat fins. The fins consume extensively less energy at anchor to achieve the same stabilization level as flat fins. By using the same energy, they stabilize more.

## Fin Dimension MC_1025

| Dimension code | Dimension descriptions | SPS40E | | | | SPS50E | | | | SPS60E | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | V4-8 ≤35 knots | | V3-9 ≤23 knots | | V4-8HS ≤40 knots | | V4-12 ≤35 knots | | V3-14 ≤23 knots | | V4-15 ≤35 knots | | V4-12HS ≤40 knots | |
| | | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch |
| A | Total fin length | 1342 | 52.8 | 1433 | 56.4 | 1342 | 52.8 | 1574 | 62.0 | 1751 | 68.9 | 1805 | 71.1 | 1574 | 62.0 |
| B | Fin length to centre connection | 1134 | 44.6 | 1220 | 48.0 | 1134 | 44.6 | 1330 | 52.4 | 1490 | 58.7 | 1525 | 60.0 | 1330 | 52.4 |
| C | Total fin height | 652 | 25.7 | 690 | 27.2 | 652 | 25.7 | 764 | 30.1 | 843 | 33.2 | 876 | 34.5 | 764 | 30.1 |
| D | Fin width from centre connection | 396 | 15.6 | 426 | 16.8 | 396 | 15.6 | 465 | 18.3 | 520 | 20.5 | 534 | 21.0 | 465 | 18.3 |
| E | Total fin width | 471 | 18.5 | 501 | 19.7 | 476 | 18.7 | 543 | 21.4 | 613 | 24.1 | 627 | 24.7 | 558 | 22.0 |

| Dimension code | Dimension descriptions | SPS70E | | | | | | SPS80E | | | | | | SPS100E | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | V4-19 ≤35 knots | | V4-15HS ≤40 knots | | V4-21 ≤23knots | | V3-23 ≤23 knots | | V4-21HS ≤40 knots | | V4-26 ≤35 knots | | V4-26HS | | V5-31 ≤23 knots | |
| | | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch |
| A | Total fin length | 2000 | 78.7 | 1805 | 71.1 | 2155 | 84.8 | 2256 | 88.8 | 2155 | 84.8 | 2329 | 91.7 | 2329 | 91.7 | TBD | TBD |
| B | Fin length to centre connection | 1690 | 66.5 | 1525 | 60.0 | 1821 | 71.7 | 1920 | 75.6 | 1821 | 71.7 | 1966 | 77.4 | 1966 | 77.4 | TBD | TBD |
| C | Total fin height | 970 | 38.1 | 876 | 34.5 | 1047 | 41.2 | 1086 | 42.8 | 1047 | 41.2 | 1131 | 44.5 | 1131 | 44.5 | TBD | TBD |
| D | Fin width from centre connection | 590 | 23.2 | 534 | 21.0 | 635 | 25.0 | 670 | 26.4 | 635 | 25.0 | 686 | 27.0 | 686 | 27.0 | TBD | TBD |
| E | Total fin width | 700 | 27.5 | 627 | 24.7 | 760 | 29.9 | 795 | 31.3 | 760 | 29.9 | 811 | 31.9 | 811 | 31.9 | TBD | TBD |

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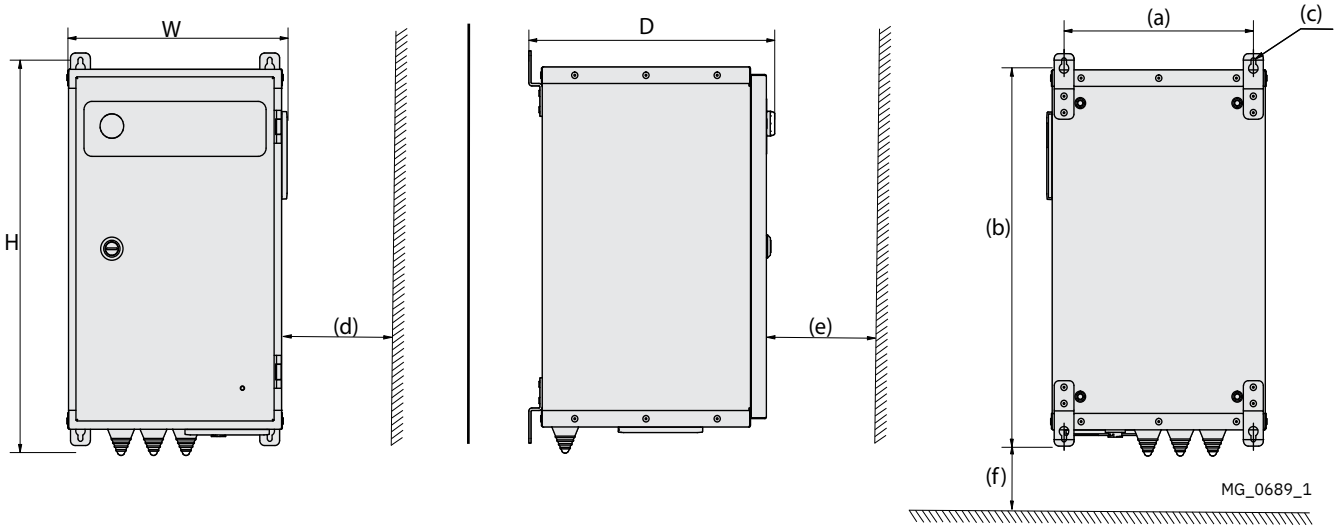
**eVision eFD**

The eFD is the control and power relay between the Actuator and the stabilizer control unit (SCU), used in the SPS60E and SPS80E systems. Supplied with 2.5 / 4.5 / 7 meter long encoder- and power cables for connection to the actuator. Mount the eFD in proximity of the actuator to ensure that the cables can be connected. Mount with the cables pointing down and in a ventilated area with maximum 50°C ambient temperature, IP56.

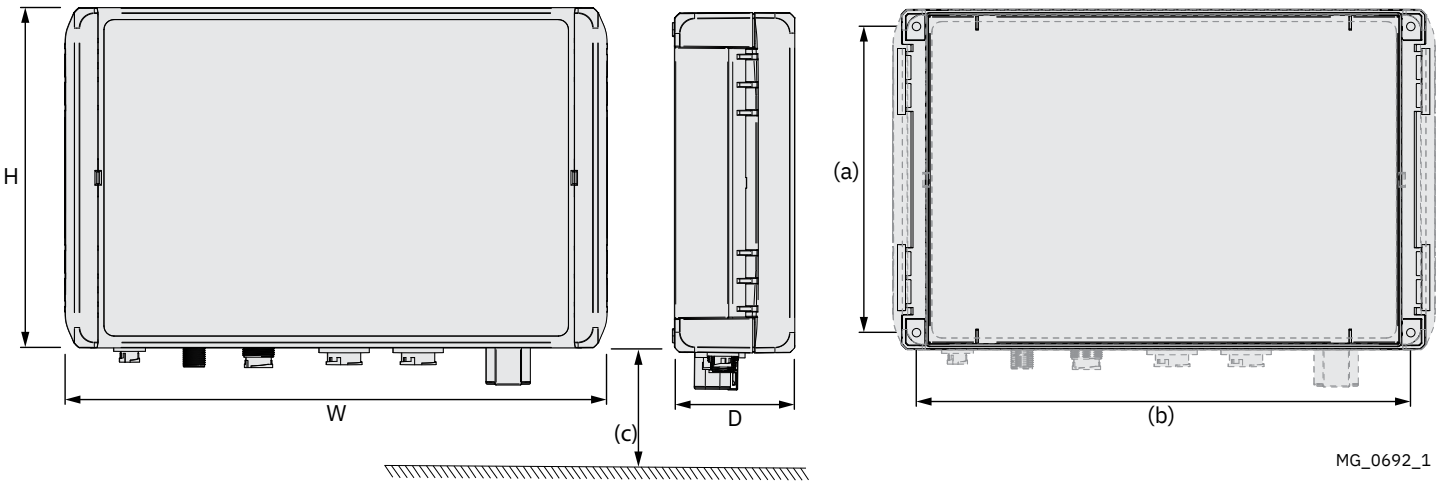
| Dimension code | Dimension descriptions | mm | inch |
|---|---|---|---|
| H | Height | 479 | 18.85 |
| W | Width | 278 | 10.94 |
| D | Depth | 311 | 12.24 |
| (a) | Mounting hole height | 463 | 18.22 |
| (b) | Mounting hole width | 239 | 9.41 |
| (c) | Mounting hole diameter | 6 | 0.24 |
| (d) | Required sidewaye free space | 278 | 10.94 |
| (e) | Required front free space | 500 | 19.6 |
| (f) | Required cable crearance | 250 | 10 |




**Stabilizer Control Unit - SCU**

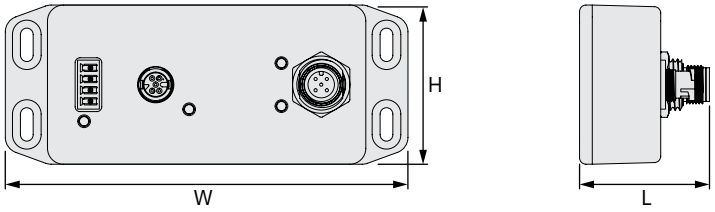
The main SCU with sensors should be placed on a bulkhead - as close to the vessel's boat roll centre - but not essential. Can be facing forward or aft, - remember to tell the system which position during setup. Avoid fitting to a vibrating structure as the unit contains the sensors used to register boat movement. The SCU LCD allows local control of parameters. Startup tasks can be performed directly from the user interface.

| Dimension code | Dimension descriptions | mm | inch |
|---|---|---|---|
| H | Height | 170 | 7 |
| W | Width | 271 | 11 |
| D | Depth | 60 | 2 |
| (a) | Mounting hole height | 153 | 6 |
| (b) | Mounting hole width | 247 | 9.7 |
| (c) | Rerquired cable clearance | 250 | 10 |



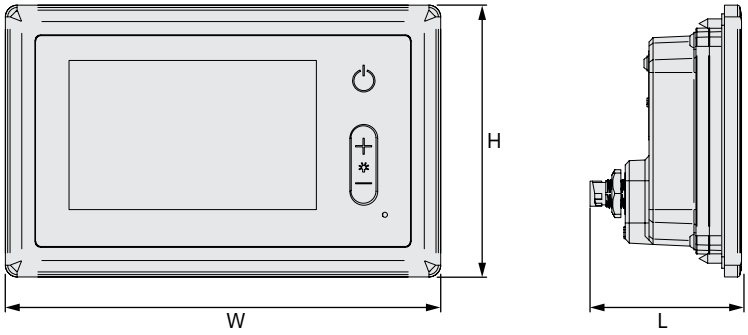
**GW-1 'Gateway'**
The GW-1 is enabling the use of GPS data for s-link devices. GPS messages can be received from NMEA0183 compatible GPS-receivers, or optionally through the NMEA2000 input connector provided on the unit. Avoid fitting to structures that have a lot of engine vibrations

| Dimension code | Dimension descriptions | mm | inch |
|---|---|---|---|
| W | Widtht | 127 | 5 |
| H | Height | 49 | 2 |
| L | Lenght | 41 | 1.6 |




**TP-43 Stabilizer Operating Panel**
The main operating panel can be fitted on the dashboard(s) from the front using four screws with a smooth plastic cover. It can also be "flush-mounted" by rear-fitting using studs. The Stabilizer operating panel is a 4,3" sunlight readable touch panel, that is used for setup and operation of the stabilizer system as well as other parts of the S-link system.

| Dimension code | Dimension descriptions | mm | inch |
|---|---|---|---|
| W | Widtht | 165 | 6.5 |
| H | Height | 103 | 4 |
| L | Lenght | 55 | 2 |




## Support Components

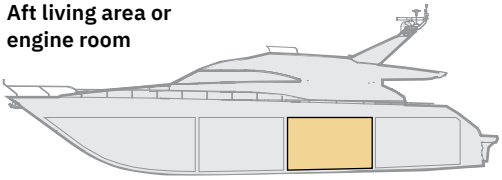
All of the components mentioned in this manual are necessary to operate the stabilizer system.
If your system is missing some of these components contact, a Sleipner dealer to obtain the latest model to complete your stabilizer installation.

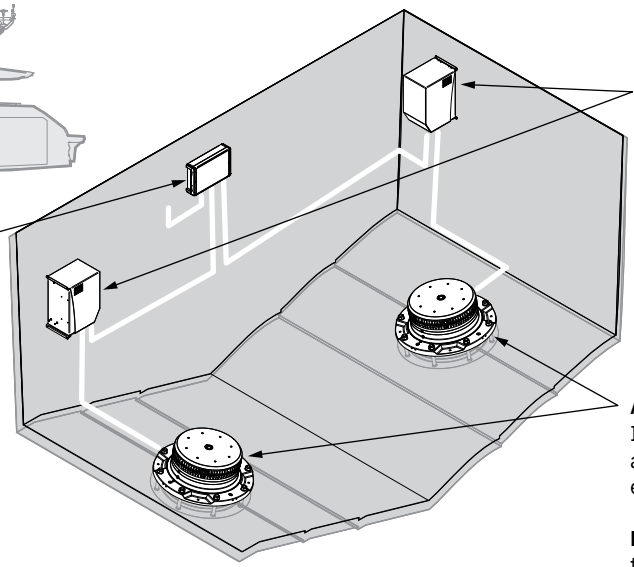
**GPS receiver**
Interfaced either through the NMEA 0183- or the NME 2000 port on GW-1. The GPS antenna should be installed where it can get a clear view of the sky and not be in the shadow of obstructions.

**Aft living area or engine room**
**eVision Actuator**, **eFD** and **SCU** are typically installed within the same compartment at the front of the engine room or aft of the cabin forward of the engine room. If these components are mounted on a bulkhead facing towards a living space, which is a typical position - ensure to mount on dampening material so no structural borne noise reach the living space.

**Helm**
The **Stabilizer operating panel** can be fitted on the dashboard(s) from the front using four screws with a smooth plastic cover, or it can also be "flush-mounted" by rear-fitting using studs. The **GW-1** should be placed relatively close to the helm dashboard and within 10m from the **GPS receiver**.

**Aft living area or engine room**





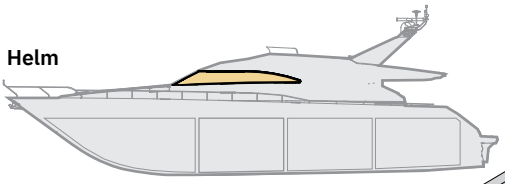
**eFD**
Installed on a bulkhead or similar - close to the actuator units. Avoid fitting to structures that have a lot of engine vibrations.

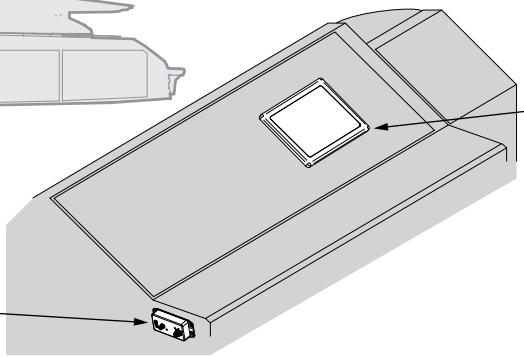
**SCU**
Installed on a bulkhead - as close to the vessel's boat roll centre facing forward or aft. Avoid fitting to structures that have a lot of engine vibrations.

**Actuators**
Installed on the bottom of the hull, and avoiding any modifications to stringers or elements effecting boat hull integrity.

**NOTE:** The hull must be reinforced where the actuators will be installerd to achieve the required hull strenght.

**Helm**





**Stabilizer Operating Panel TP-43a**
Fitted on the dashboard(s) from the front using four screws with a smooth plastic cover, or it can also be "flush-mounted" by rear-fitting using studs.

**GW-1**
Installed relatively close to the dashboard within 10m from the GPS receiver. GW-1 is normally installed hidden under the dashboard and connects to S-Link backbone.
**NOTE: The GPS receiver must be placed on the outside of the vessel.**

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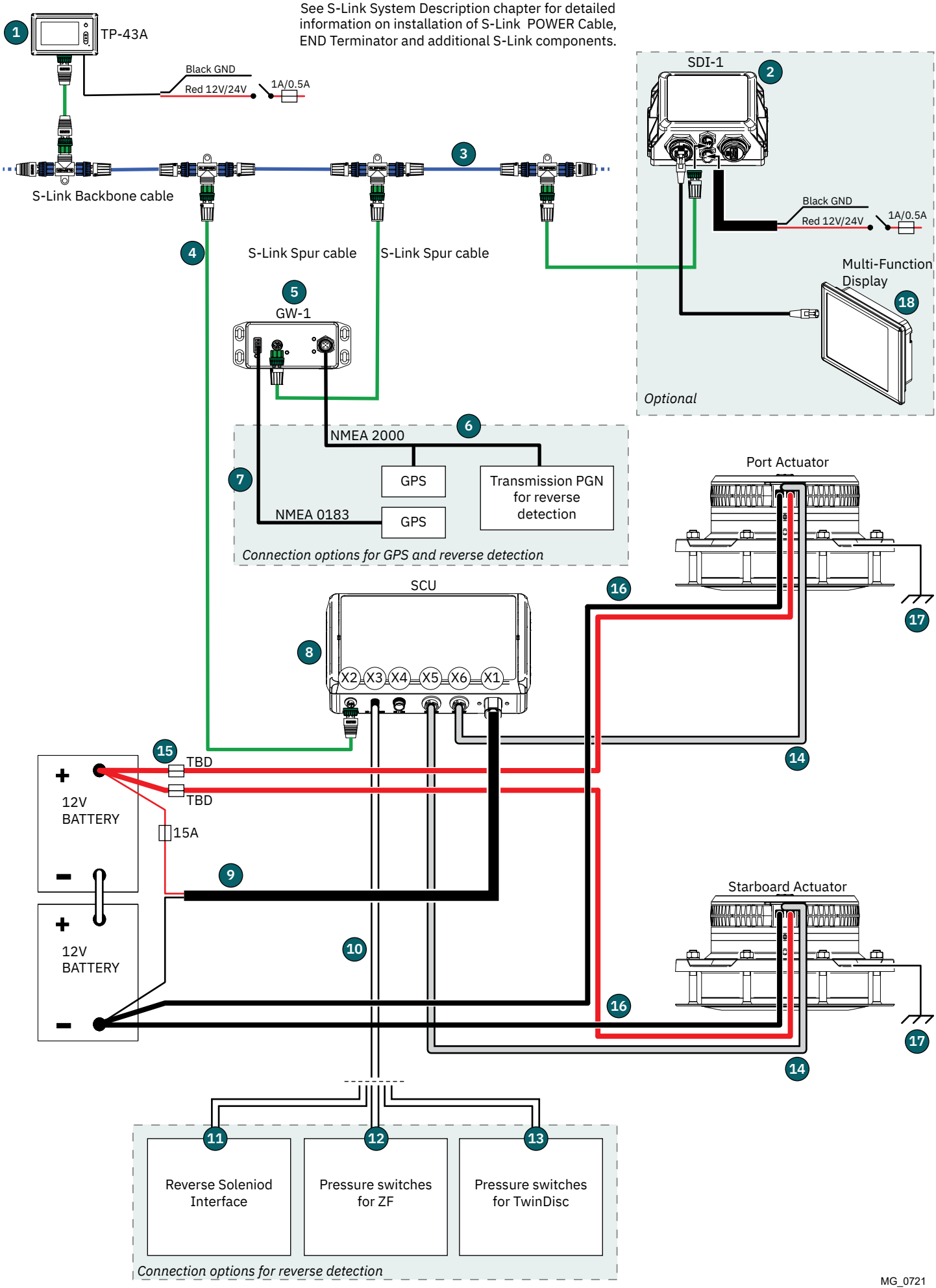
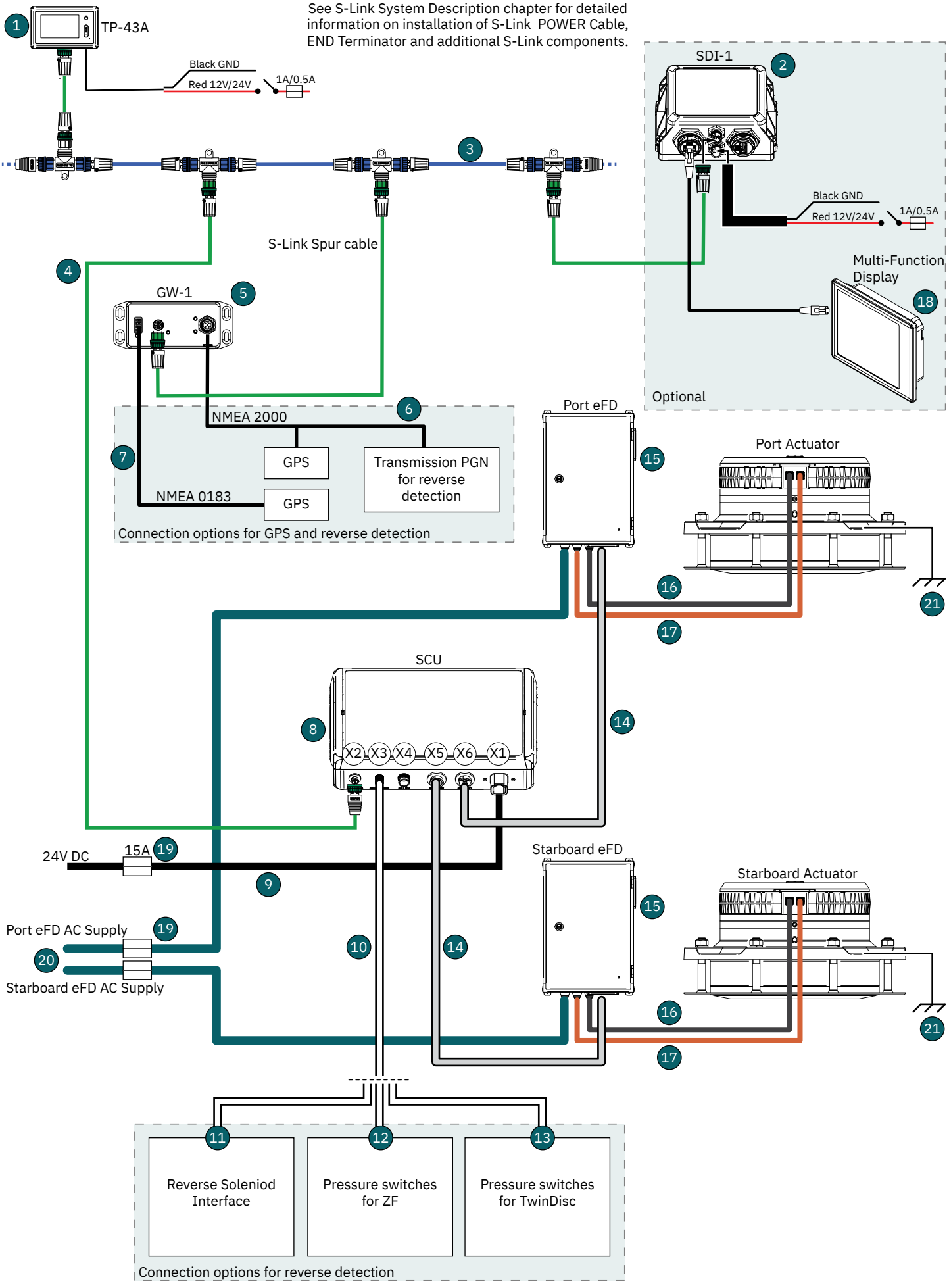
# Wiring diagram for the DC actuators SPS40E, SPS50E & SPS60E



# Wiring diagram for the AC actuators SPS60E, SPS70E, SPS80E & SPS100E

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# S-Link system description

S-Link is a CAN-based control system used for communication between Sleipner products installed on a vessel. The system uses BACKBONE Cables as a common power and communication bus with separate SPUR Cables to each connected unit. Only one S-Link POWER cable shall be connected to the BACKBONE Cable. Units with low power consumption are powered directly from the S-Link bus.

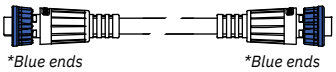
**Main advantages of S-Link system:**
- Compact and waterproof plugs.
- BACKBONE and SPUR Cables have different colour coding and keying to ensure correct and easy installation. BACKBONE Cables have blue connectors and SPUR Cables have green connectors.
- Different cable lengths and BACKBONE Extenders make the system scalable and flexible to install.

**Installation of S-Link cables:**
Select appropriate cables to keep the length of BACKBONE- and SPUR Cables to a minimum. In case of planned installation with total BACKBONE Cable length exceeding 100 meters please consult your local distributor. The S-Link cables should be properly fastened when installed to avoid sharp bend radius, cable chafing and undesired strain on connectors. Locking mechanism on connectors must be fully closed. To ensure long lifetime, cables, T-Connectors and Extenders should not be located so that they are permanently immersed in water or other fluids. It is recommended to install cables in such a way that water and condensation do not flow along the cables into the connectors. This can be done for example by introducing a u-shape bend before the cable enters the product connector.

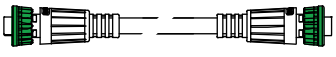
Ideally, the POWER Cable should be connected to the middle of the BACKBONE bus to ensure an equal voltage drop at both ends of the BACKBONE Cable. The yellow and black wire in the POWER Cable shall be connected to GND and the red wire connected to +12VDC or +24VDC.

To reduce the risk of interference, avoid routing the S-Link cables close to equipment such as radio transmitters, antennas or high voltage cables. The backbone must be terminated at each end with the END Terminator.

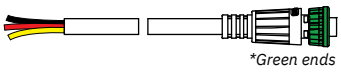
SPUR cables can be left unterminated to prepare for the installation of future additional equipment. In such cases, ensure to protect open connectors from water and moisture to avoid corrosion in the connectors.



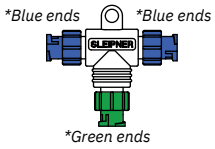

**BACKBONE Cable**
Forms the communication and power bus throughout a vessel. Available in different standard lengths.




**SPUR Cable**
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.

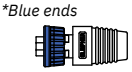



**POWER Cable**
Required in all installations for connection of BACKBONE Cable to a power supply and should be protected with a 2A fuse.

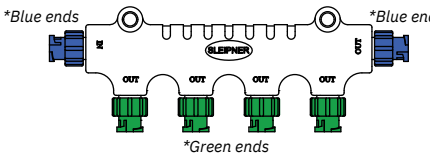



**T-Connector**
Used for connection of SPUR or POWER Cable to the BACKBONE Cable. One T-Connector for each connected cable.


**BACKBONE Extender**
Connects two BACKBONE Cables to extend the length.

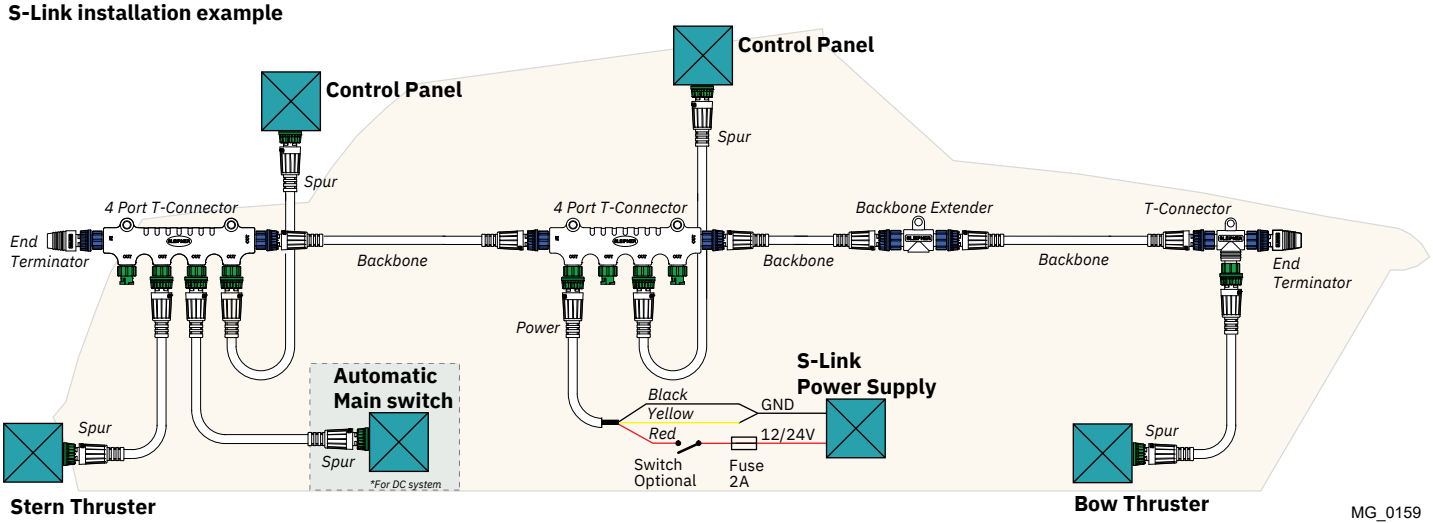



**END Terminator**
Must be one at each end of the BACKBONE bus.




**4-Port T-Connector**
The 4-PORT T-connector allows multiple SPUR Cables to be connected. The 4-PORT T-connector comes with two sealing caps to protect unused ports.

**S-Link installation example**

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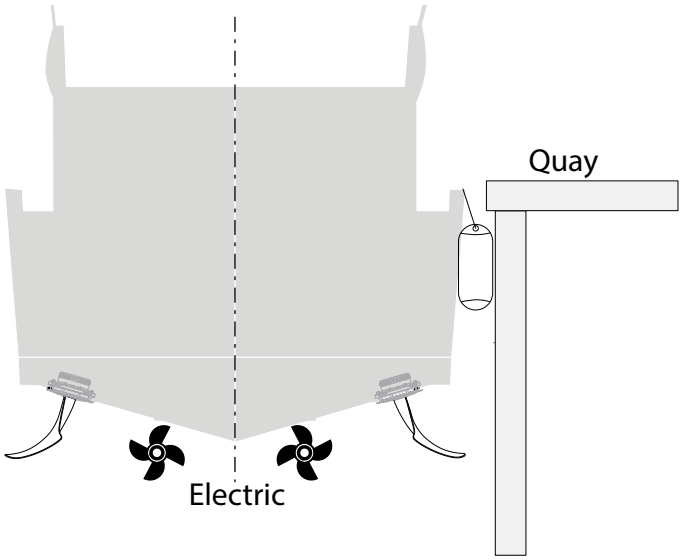
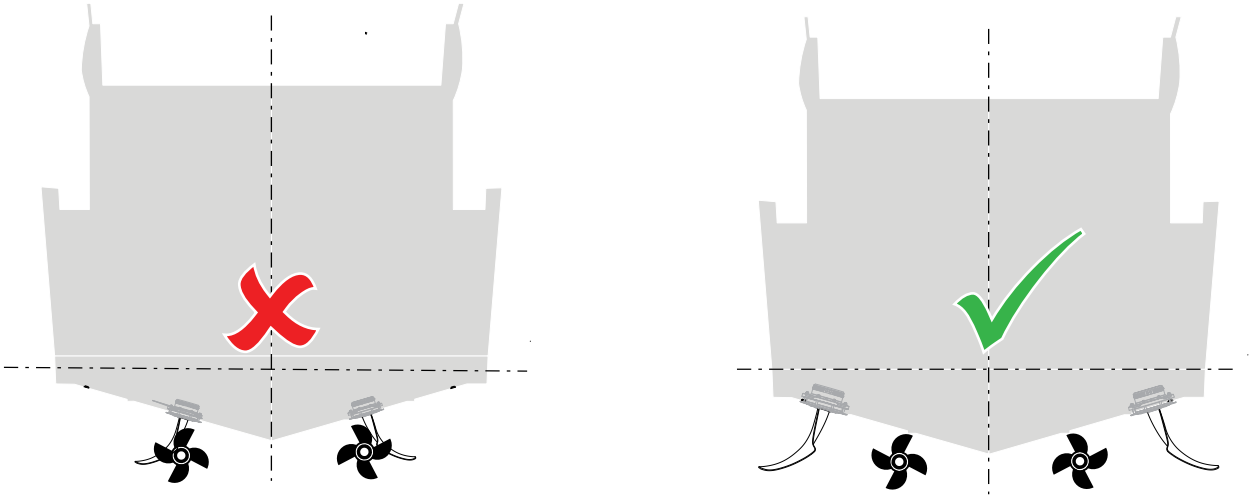
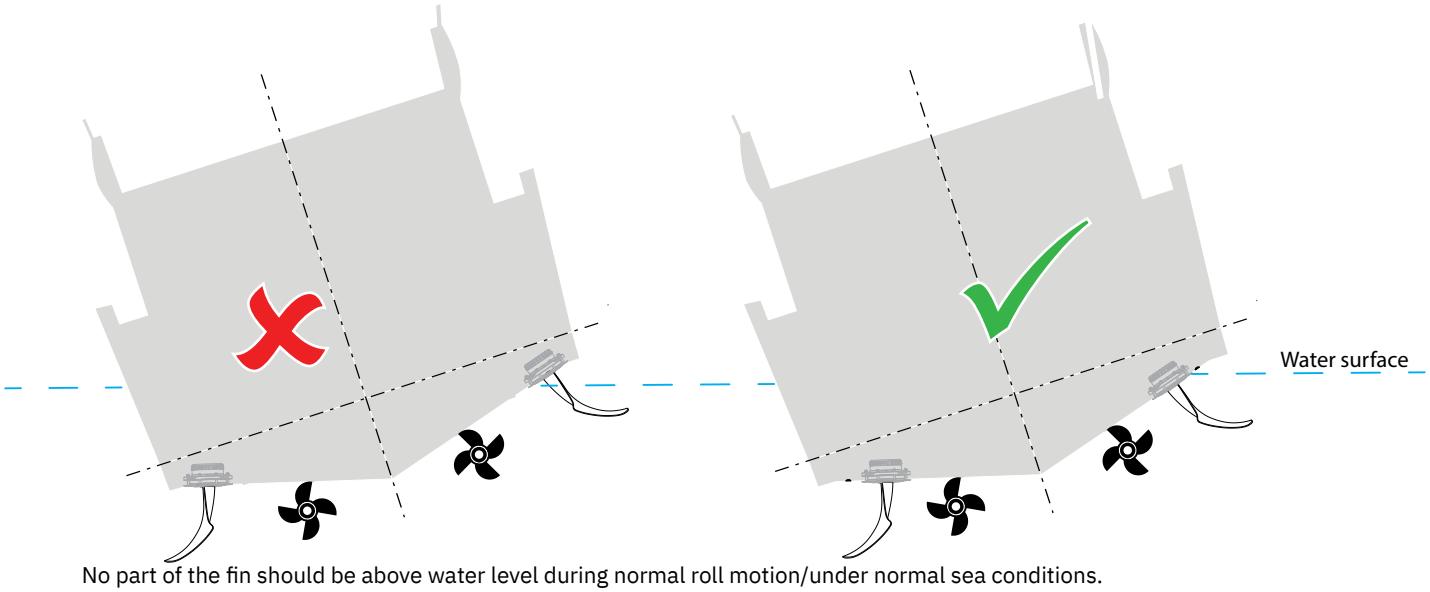



Fins should not extend outside the beam including the fenders, or below the keel/propeller when i neutral position.

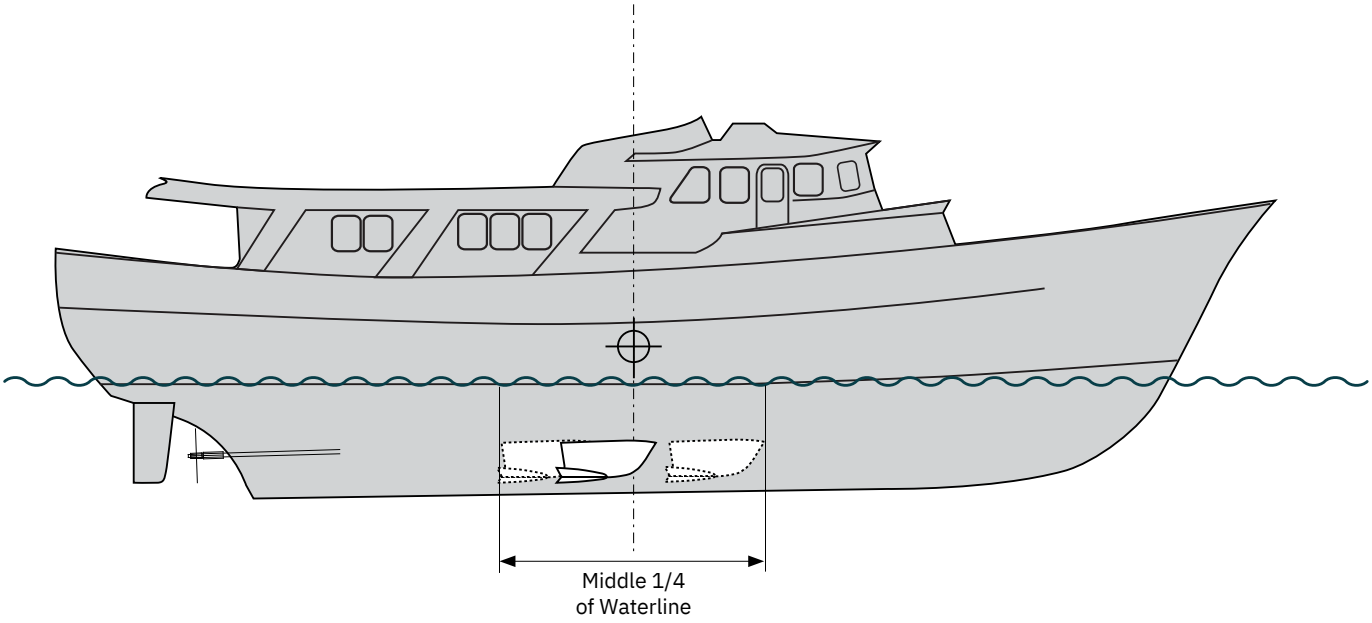


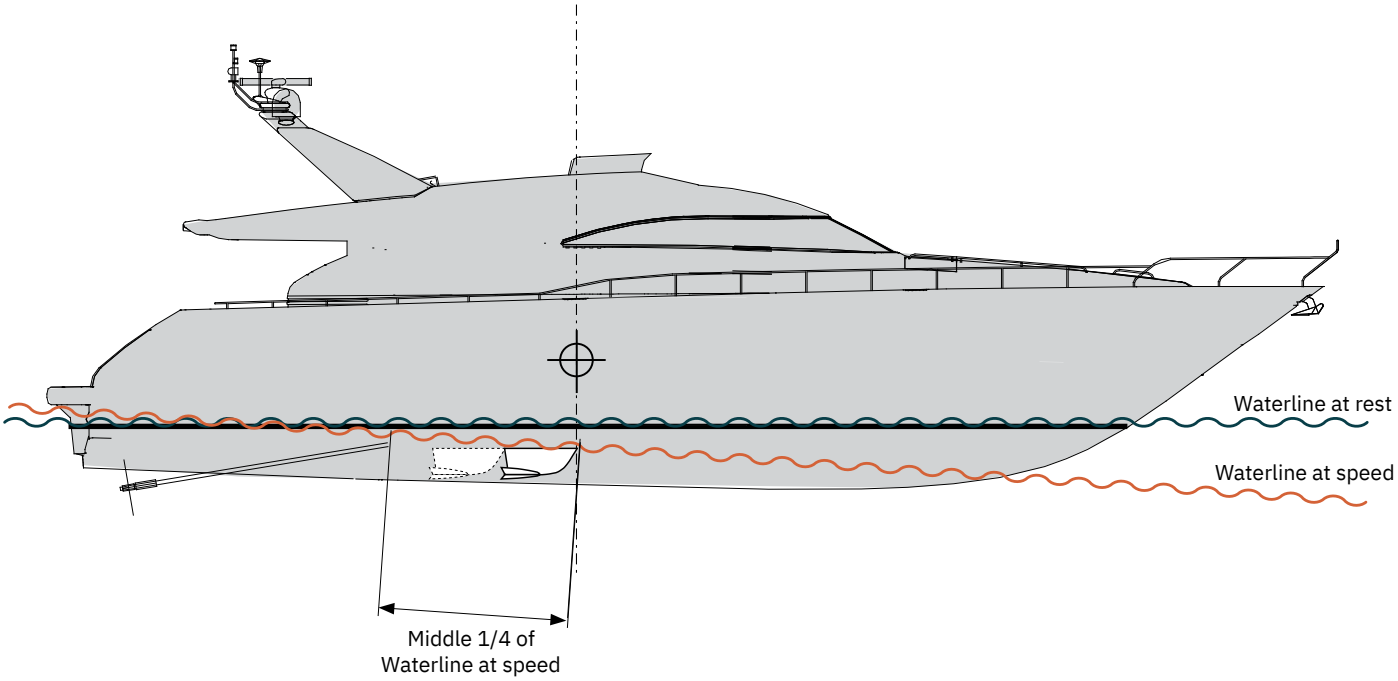
Fins should be placed as far outboard as possible, and NOT in-line with the propellers, to ensure avoiding possible disturbance of the water flow to the props which in the worst case can cause vibrations / cavitation.




No part of the fin should be above water level during normal roll motion/under normal sea conditions.

MG_0956_1




To avoid unwanted influences on the steering characteristics, the fins should be placed close to the vessel longitudinal centre of gravity (LCG)
- If unknown, this is usually a little aft of 50% of the waterline length.

For high speed vessels, the fins should be placed with trailing/leading edge within middle 1/4 of waterline length at speed and not in front of the LCG.

For vessels with top speed under 15 knots, fin may be placed within the middle 1/4 of waterline length.

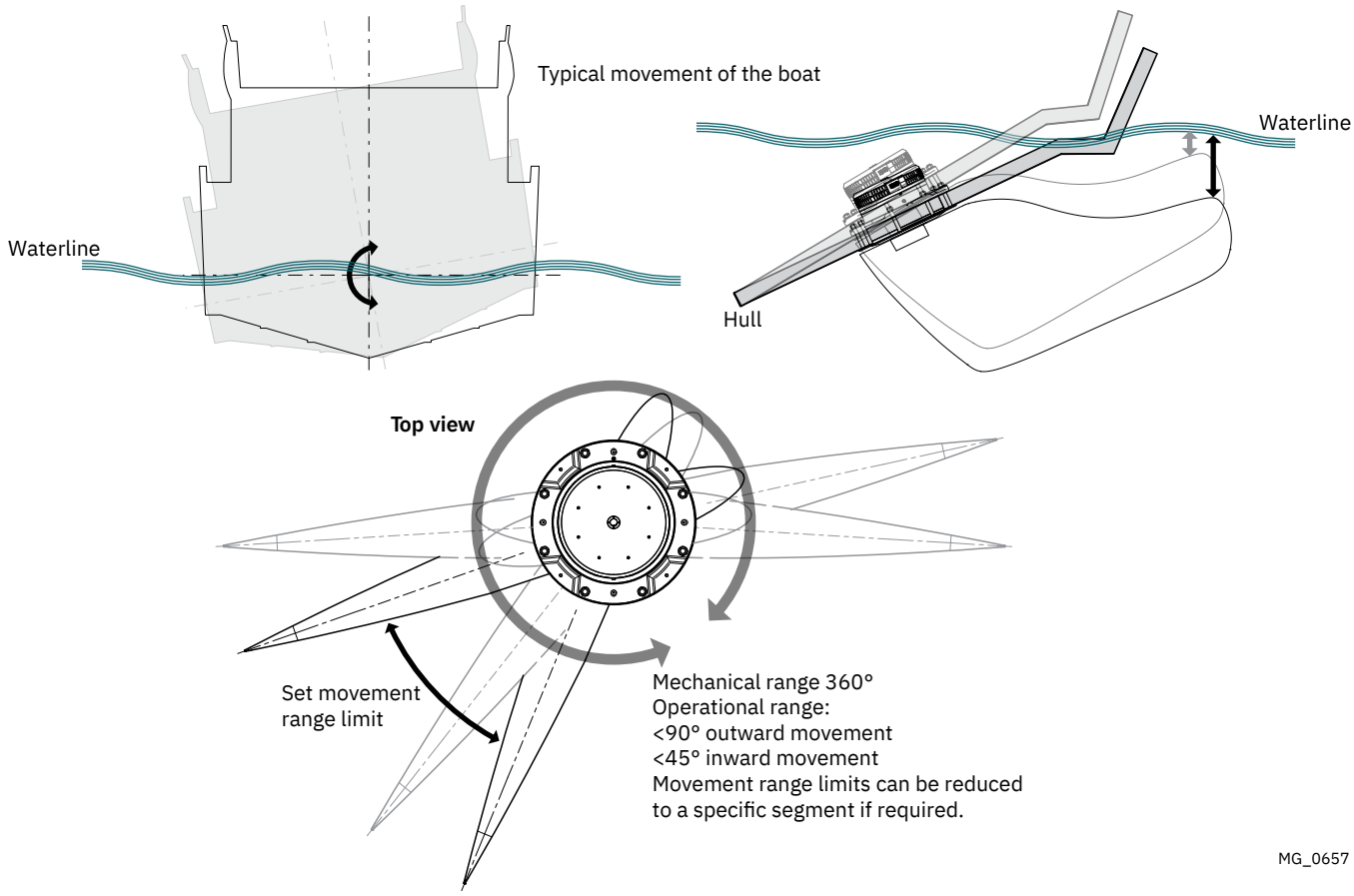
***(NB: These are general guidelines and some hull types might allow for an installation position outside of this recommendation.)***

**Transversal fin positioning of Vector Fins™**

With Vector finsTM it is a priority to push the fins as far outboard as possible to achieve the most leverage for the fins forces unlike standard fins.

Finding the best position for the fin and actuator positioning often is related to the inside configuration and space that is required for proper installation.

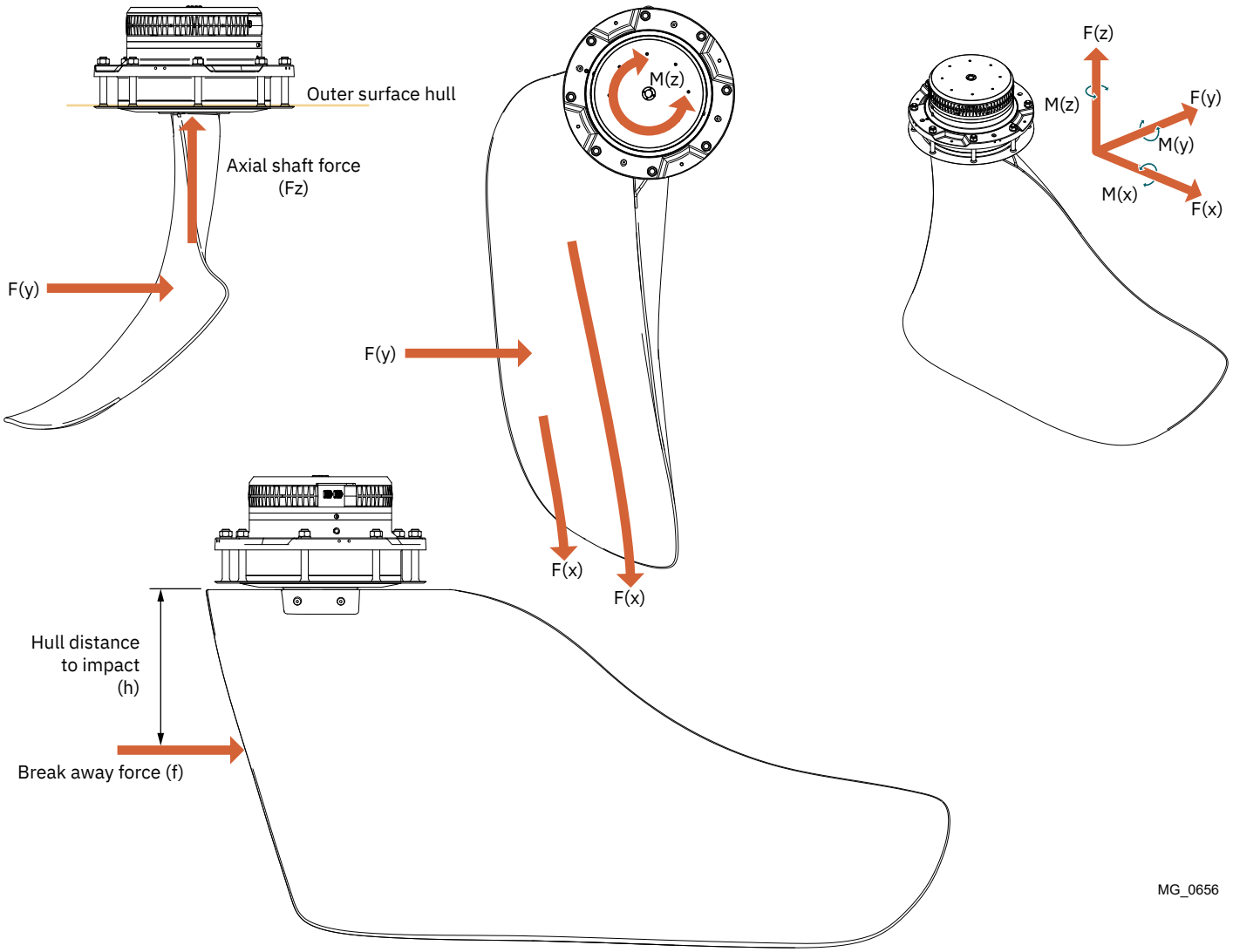
**General Rules:**
–Push the actuators as far as possible outboard, keeping at least 22 degrees of outboard stroke as a minimum. It is also acceptable installing the fins further inboard If inside configuration/ access to inside parts of actuators is required. ***(NB: Performance will be reduced slightly due to less leverage arm for the stabilizing force applied by the fins.)***




MG_0657

All calculated values are normalised, determined by equilibrium considerations and also that various coefficients are inaccurate as hull design etc will affect the actual fin effect.
Dynamic effects such as jumps/impacts with waves, back flow closing of valve etc could further increase the hull/shaft loads. Therefore all dimensioning should account for this by using a safety factor.

Sleipner curved Vector Fin design comes with additional benefits in hull safety. Any impact with the ground will not only bend the shaft backwards and outward, allowing the fin to break away with less stress on the hull.



| SPS40E | | | | | | | |
|---|---|---|---|---|---|---|---|
| Structural requirements V3-9 | | Values to be considerated individually | | | | Break away impact force | |
| Speed | Max bending moment (kNm) | Mx (kNm) | My (kNm) | Mz (kNm) | Fz (kNm) | h (mm) | f (kN) |
| 20 | 11,9 | 11,4 | 3,3 | 2,2 | 14,7 | 400 | 48 |
| 25 | 13,0 | 12,3 | 3,3 | 2,2 | 14,7 | | |

| SPS40E | | | | | | | |
|---|---|---|---|---|---|---|---|
| Structural requirements V4-8 | | Values to be considerated individually | | | | Break away impact force | |
| Speed | Max bending moment (kNm) | Mx (kNm) | My (kNm) | Mz (kNm) | Fz (kNm) | h (mm) | f (kN) |
| 20 | 12,4 | 11,2 | 4,0 | 2,2 | 17,2 | 400 | 61 |
| 30 | 16,6 | 13,1 | 4,0 | 2,2 | 24,0 | | |
| 35 | 19,7 | 17,5 | 4,2 | 2,2 | 26,7 | | |

| SPS50E | | | | | | | |
|---|---|---|---|---|---|---|---|
| Structural requirements V4-12 | | Values to be considerated individually | | | | Break away impact force | |
| Speed | Max bending moment (kNm) | Mx (kNm) | My (kNm) | Mz (kNm) | Fz (kNm) | h (mm) | f (kN) |
| 20 | 16,1 | 15,6 | 4,9 | 2,2 | 19,6 | 450 | 83 |
| 30 | 22,4 | 21,7 | 4,9 | 2,2 | 27,3 | | |
| 35 | 23,2 | 23,1 | 5,2 | 2,2 | 29,4 | | |

| SPS50E | | | | | | | |
|---|---|---|---|---|---|---|---|
| Structural requirements V4-8HS | | Values to be considerated individually | | | | Break away impact force | |
| Speed | Max bending moment (kNm) | Mx (kNm) | My (kNm) | Mz (kNm) | Fz (kNm) | h (mm) | f (kN) |
| 20 | 12,4 | 11,2 | 4,0 | 2,2 | 17,2 | 400 | 61 |
| 30 | 16,6 | 13,1 | 4,0 | 2,2 | 24,0 | | |
| 35 | 19,7 | 17,5 | 4,2 | 2,2 | 26,7 | | |
| 40 | 22,8 | 21,9 | 4,4 | 2,2 | 29,4 | | |

| SPS60E | | | | | | | |
|---|---|---|---|---|---|---|---|
| Structural requirements V3-14 | | Values to be considerated individually | | | | Break away impact force | |
| Speed | Max bending moment (kNm) | Mx (kNm) | My (kNm) | Mz (kNm) | Fz (kNm) | h (mm) | f (kN) |
| 20 | 22,6 | 21,2 | 6,1 | 3,7 | 21,0 | 500 | 90 |
| 25 | 24,4 | 23,5 | 6,1 | 3,7 | 21,0 | | |

| SPS60E | | | | | | | |
|---|---|---|---|---|---|---|---|
| Structural requirements V4-15 | | Values to be considerated individually | | | | Break away impact force | |
| Speed | Max bending moment (kNm) | Mx (kNm) | My (kNm) | Mz (kNm) | Fz (kNm) | h (mm) | f (kN) |
| 20 | 27,0 | 25,4 | 8,4 | 3,7 | 25,9 | 500 | 109 |
| 30 | 28,2 | 27,7 | 8,4 | 3,7 | 30,6 | | |
| 35 | 32,0 | 32,4 | 9,6 | 3,7 | 36,1 | | |

| SPS60E | | | | | | | |
|---|---|---|---|---|---|---|---|
| Structural requirements V4-12HS | | Values to be considerated individually | | | | Break away impact force | |
| Speed | Max bending moment (kNm) | Mx (kNm) | My (kNm) | Mz (kNm) | Fz (kNm) | h (mm) | f (kN) |
| 20 | 19 | 19 | 4,5 | 3 | 18 | 450 | 83 |
| 30 | 29 | 28 | 7 | 3 | 32 | | |
| 35 | 38 | 36 | 9 | 3 | 44 | | |
| 40 | 42 | 38 | 9 | 3 | 46 | | |

| SPS70E | | | | | | | |
|---|---|---|---|---|---|---|---|
| Structural requirements V4-19 | | Values to be considerated individually | | | | Break away impact force | |
| Speed | Max bending moment (kNm) | Mx (kNm) | My (kNm) | Mz (kNm) | Fz (kNm) | h (mm) | f (kN) |
| 20 | 36,8 | 35,0 | 11,4 | 5,8 | 33,6 | 600 | 147 |
| 30 | 50,8 | 46,9 | 11,4 | 5,8 | 49,0 | | |
| 35 | 52,9 | 52,5 | 11,9 | 5,8 | 53,4 | | |

| SPS70E | | | | | | | |
|---|---|---|---|---|---|---|---|
| Structural requirements V4-15HS | | Values to be considerated individually | | | | Break away impact force | |
| Speed | Max bending moment (kNm) | Mx (kNm) | My (kNm) | Mz (kNm) | Fz (kNm) | h (mm) | f (kN) |
| 20 | 29,8 | 27,1 | 9,1 | 5,8 | 31,5 | 500 | 109 |
| 30 | 41,1 | 39,4 | 9,6 | 5,8 | 43,8 | | |
| 35 | 45,1 | 43,8 | 10,1 | 5,8 | 48,1 | | |
| 40 | 49,0 | 48,1 | 10,5 | 5,8 | 52,5 | | |

| SPS70E | | | | | | | |
|---|---|---|---|---|---|---|---|
| Structural requirements V4-21 | | Values to be considerated individually | | | | Break away impact force | |
| Speed | Max bending moment (kNm) | Mx (kNm) | My (kNm) | Mz (kNm) | Fz (kNm) | h (mm) | f (kN) |
| 20 | 41,5 | 40,3 | 12,3 | 5,8 | 36,8 | 700 | 218 |
| 25 | 44,8 | 45,1 | 14,0 | 5,8 | 43,8 | | |

| SPS80E | | | | | | | |
|---|---|---|---|---|---|---|---|
| Structural requirements V3-23 | | Values to be considerated individually | | | | Break away impact force | |
| Speed | Max bending moment (kNm) | Mx (kNm) | My (kNm) | Mz (kNm) | Fz (kNm) | h (mm) | f (kN) |
| 20 | 43,9 | 42,35 | 10,7 | 7,0 | 32 | 700 | 218 |
| 25 | 47,4 | 46,6 | 12,6 | 7,0 | 36,0 | | |

| SPS80E | | | | | | | |
|---|---|---|---|---|---|---|---|
| Structural requirements V4-26 | | Values to be considerated individually | | | | Break away impact force | |
| Speed | Max bending moment (kNm) | Mx (kNm) | My (kNm) | Mz (kNm) | Fz (kNm) | h (mm) | f (kN) |
| 20 | 52,9 | 50,75 | 15,8 | 7,0 | 40 | 700 | 218 |
| 30 | 72,3 | 70,9 | 18,0 | 7,0 | 60,0 | | |
| 35 | 74,8 | 75,7 | 18,0 | 7,0 | 64,3 | | |

| SPS80E | | | | | | | |
|---|---|---|---|---|---|---|---|
| Structural requirements V4-21HS | | Values to be considerated individually | | | | Break away impact force | |
| Speed | Max bending moment (kNm) | Mx (kNm) | My (kNm) | Mz (kNm) | Fz (kNm) | h (mm) | f (kN) |
| 20 | 45,7 | 43,8 | 14,4 | 7,0 | 39,0 | 700 | 218 |
| 30 | 63,4 | 62,1 | 16,4 | 7,0 | 56,2 | | |
| 35 | 67,6 | 67,4 | 16,4 | 7,0 | 61,5 | | |
| 40 | 71,8 | 72,6 | 16,1 | 7,0 | 66,9 | | |

| SPS100E | | | | | | | |
|---|---|---|---|---|---|---|---|
| Structural requirements 4-26HS | | Values to be considerated individually | | | | Break away impact force | |
| Speed | Max bending moment (kNm) | Mx (kNm) | My (kNm) | Mz (kNm) | Fz (kNm) | h (mm) | f (kN) |
| 20 | 64,8 | 63,0 | 22,8 | 15,8 | 52,5 | 700 | 218 |
| 30 | 103,3 | 101,5 | 24,5 | 15,8 | 77,0 | | |
| 35 | 110,3 | 107,6 | 25,4 | 15,8 | 86,6 | | |
| 40 | 117,3 | 113,8 | 26,3 | 15,8 | 96 | | |

| SPS100E | | | | | | | |
|---|---|---|---|---|---|---|---|
| Structural requirements V5-31 | | Values to be considerated individually | | | | Break away impact force | |
| Speed | Max bending moment (kNm) | Mx (kNm) | My (kNm) | Mz (kNm) | Fz (kNm) | h (mm) | f (kN) |
| TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |

| Cable description | Located |
|---|---|
| Panel Power supply cable Part# 151090-020 - 2m | Included in the SCU kit |
| SCU Power supply cable Part# 151371-025 - 2,5m | Included in the SCU kit |
| GPS Receiver Part# 321714 - 10m | Included in the actuator kit |
| Reverse detection cable Part# 151375-100 - 10m | Included in the SCU kit |
| SCU-eFD cable Part# 151370-040 - 4m<br>SCU-eFD cable Part# 151370-070 - 7m<br>SCU-eFD cable Part# 151370-100 - 10m<br>SCU-eFD cable Part# 151370-150 - 15m<br>SCU-eFD cable Part# 151370-200 - 20m<br>SCU-eFD cable Part# 151370-250 - 25m<br>SCU-eFD cable Part# 151370-300 - 30m | Included in the actuator kit |

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