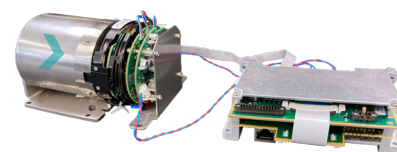


Phins Compact Series

Most Compact Inertial Navigation System for UUV's

Based on FOG technology mastered by Exail for over 30 years, Exail offers a complete range of high-grade inertial navigation systems dedicated to unmanned vehicles.



Phins Compact C3



Phins 9 Compact



Phins Compact C7

FEATURES

- Most compact high grade INS
- Low power consumption for an increased autonomy
- Navigation algorithm tailored for subsea autonomous operations dedicated for subsea operations
- Genuine strapdown solid-state system

BENEFITS

- Stealth autonomous navigation
- Very accurate heading, roll, pitch, speed and position
- Common interfaces
- Seamless integration
- Open architecture with 3rd party brand sensors

MAIN REFERENCES

- | | |
|--|---------------|
| • VATN | • Fugro |
| • Kongsberg | • BAE systems |
| • Huntington Ingalls Industries | • ISE |
| • L3 Harris | • Bedrock |
| • Exail Robotics | • RTS |
| • SAAB | • Shearwater |
| • Woods Hole Oceanographic Institution | • RTSys |
| • Teledyne Gavia | • Sharkmarine |

Proven and reliable expertise

Exail has been providing inertial navigation systems and acoustic positioning systems for AUVs for more than 15 years. This almost unique experience allows us to provide the widest range of systems fitting all needs for AUVs with unrivaled performance and a global solution approach.

Seamless design for all AUV types

Phins Compact Series has been designed to offer the UUV industry players the ability to choose an inertial navigation system adapted to their vehicle, whatever their size and mission, from accurate navigation to survey grade.

Ease of use, reliability and availability

Phins Compact Series is fully scalable systems with a similar architecture and interface. The series includes the same algorithm and software, which enables seamless re-use of the control system on any vehicles, sizes or types, via modern interfaces such as Ethernet, helping to reduce integration and non-recurring costs.

TECHNICAL SPECIFICATIONS

Performance / Characteristics

	Phins Compact C3	Phins 9 Compact	Phins Compact C7
Position accuracy ⁽¹⁾			
With GNSS/USBL/LBL	Three times better than GNSS / USBL / LBL	Three times better than GNSS / USBL / LBL	Three times better than GNSS / USBL / LBL
DVL ⁽²⁾ -Aided straight line performance	0.20 %TD (CEP 50)	0.10 %TD (CEP 50)	0.05 %TD (CEP 50)
DVL-aided optimal performances in typical conditions	0.04 %TD (CEP 50)	0.02 %TD (CEP 50)	0.01 %TD (CEP 50)
No aiding for 60 s / 120 s	Better than 2.5 m / 9.0 m	Better than 1.5 m / 6.0 m (CEP50)	Better than 0.77 m / 3.15 m (CEP50)
Speed (North and East) accuracy	0.02 Knot (RMS)	0.01 Knot (RMS)	0.01 Knot (RMS)
Heading accuracy ⁽³⁾⁽⁴⁾⁽⁵⁾			
With GNSS (or USBL/LBL) & DVL	0.10° Seclat (RMS)	0.04° seclat (RMS)	0.010° seclat (RMS)
With GNSS or DVL or USBL/LBL	0.15° seclat (RMS)	0.07° seclat (RMS)	0.025° seclat (RMS)
Roll and Pitch dynamic accuracy (no aiding)	0.05 deg RMS	0.01 deg RMS	0.01 deg RMS

Operating range / Environment

Operating / storage temperature	-15 to 60°C / -40 to 80°C	-20 to 55°C / -40 to 80°C	-20 to 55°C / -40 to 80°C
Rotation rate dynamic range	Up to 750° /Sec	Up to 750° /Sec	Up to 750° /Sec
Acceleration dynamic range	±5 g	±30 g	±15 g
Heading /roll/ pitch ranges	0 to +360 deg / ±180 deg / ±90 deg	0 to +360 deg / ±180 deg / ±90 deg	0 to +360 deg / ±180 deg / ±90 deg
MTBF	150,000 hours (System observed) 500,000 hours (FOG + Accelerometers)		

Interfaces

	Phins Compact C3	Phins 9 Compact	Phins Compact C7
Sensors	GNSS / USBL / LBL / DVL / EMLOG / DEPTH / CTD / SVP		
Serial	5 ports: RS232	5 ports: 2 RS422/RS232 3 RS232	2 ports: RS232
Ethernet	UDP (Unicast, multicast and broadcast)/ TCP client / TCP server (10 / 100 Mbits)		
Ethernet Port	7 inputs / 5 outputs	7 inputs / 5 outputs	4 inputs / 5 outputs
Pulse port	2 inputs / 1 output	3 inputs / 2 outputs	1 input / 1 output
Input/ output	Industry standards: NMEA, ASCII, Exail STD BIN etc. Multiples outputs protocols		
Baud Rate	600 bauds to 921 kbauds	600 bauds to 921 kbauds	600 bauds to 921kbauds
Data output rate	0.1 Hz to 200 Hz	0.1 Hz to 200 Hz	0.1 Hz to 200 Hz
Power supply / consumption ⁽⁶⁾	24 VDC (20 - 32 V) / < 12 W	24 VDC (9 - 36 V) / < 12 W	24 VDC (20 - 32 V) / < 20 W
Embedded Datalogger	8 GB	8 GB	8 GB

(1) CEP: 50% circular error probability. DVL aiding position accuracy is dependent on DVL performances.

(2) Exail INS are compatible with a wide range of DVL such as Nortek, Waterlinked and Teledyne RDI

(3) Typical performances, dependent on external sensor characteristics

(4) RMS values.

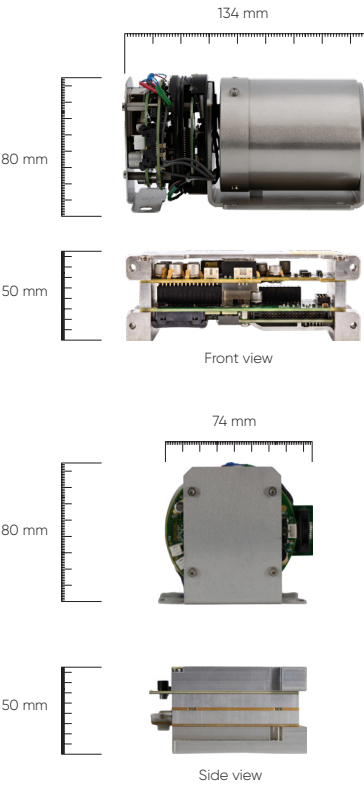
(5) Secant Latitude= 1 / Cosine Latitude

(6) Phins Compact Series power consumption, not taking into account external sensors, typical value @24V and ambient temperature.

Physical Characteristics

Material	Aluminium	Aluminium	Aluminium
Weight in air	1.7 kg	1.2 kg	3.8 kg
Connector	Power supply: 221Y06F22 Nicomatic Digital: 221Y26F22 Nicomatic Ethernet: RJ45	Main: MicroD MWDM2L-69P-PSB	Main: D-Sub 26P 17HTHAS4F1C Amphenol Ethernet: RJ45

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