



## **KN-6050 SEADeViL INS/DVL/GPS Family**

The KN-6050 family of SEADeViLs are fully qualified underwater navigators that are based on Kearfott's Monolithic Ring Laser Gyro (MRLG) based embedded Navigation Systems (INS), the Teledyne RDI Doppler Velocity Log (DVL) and internal GPS receiver. The SEADeViL INS/GPS/DVL modular architecture allows for various external aiding devices such as Speed Log, Screwspeed, Depth Sensor, Speed of Sound Sensor, GPS and position inputs.

Typical applications include the navigation of Autonomous Underwater Vehicles (AUVs) Surface Unmanned Vehicles (SUVs), Remotely Operated Vehicles (ROVs) and manned submarines.

### **KN-6050 SEADeViL Main Features and Capabilities:**

- Integrated Doppler Velocity Log (DVL)  
(300KHz, 600KHz or 1,200KHz DVL Options)
- Integrated GPS C/A
- C/A Code DGPS Ready (requires DGPS receiver)
- 1,000, 3,000 or 6,000 Meter pressure housing options
- Aiding Inputs:
  - External GPS (Option)
  - Depth Sensor
  - Position Inputs
  - Speed of Sound Sensor
- Navigation Outputs:
  - Position (Hybrid INS/DVL/GPS)
  - Altitude/Depth (Hybrid INS/DVL/GPS)
  - Ground Speed
  - True Heading
- Vehicle Stabilization Control Outputs:
  - Angular rates ( $\Delta\theta$ )
  - Linear Accelerations ( $\Delta v$ )
  - Roll and Pitch
- Communication Interfaces:
  - Multiple RS-422 Channels
  - Multiple RS-232 Channels

# KN-6050 SEADeViL System Characteristics

SEADeViL PERFORMANCE*			
Surface Ship	KN-6051 (T16 MRLG)	KN-6052 (T18 MRLG)	KN-6053 (T24 MRLG)
Position Accuracy			
1. GPS/DVL**	10 m, CEP	10 m, CEP	10 m, CEP
1. DVL (Water-Track Mode)****	10 nm/8hrs, TRMS	2 nm/8hrs, TRMS	1 nm/8hrs, TRMS
Heading Accuracy			
1. GPS/DVL**	5.0 mils, rms	<1.5 mils, rms	<1.0 mils, rms
1. DVL	5 mils* secant $\lambda$ , rms	1.0 mils* secant $\lambda$ , rms	0.5 mils * secant $\lambda$ , rms
Velocity Accuracy			
1. GPS/DVL**	0.05 m/sec	0.05 m/sec	0.05 m/sec
1. DVL (Water-Track Mode)	0.5 m/sec, rms	0.35 m/sec, rms	0.3 m/sec, rms
Roll/Pitch Accuracy	0.5 mils, rms	0.5 mils, rms	0.5 mils, rms
Underwater Vehicle*	KN-6051 (T16 MRLG)	KN-6052 (T18 MRLG)	KN-6053 (T24 MRLG)
Position Accuracy ****	0.5% DT, CEPR	0.2% DT, CEPR	0.05% DT, CEPR
Heading Accuracy	5 mils*, rms	1.5 mils*, rms	1.0 mils *, rms
Roll/Pitch Accuracy	0.5 mils, rms	0.5 mils, rms	0.5 mils, rms
OPERATING RANGES*			
Acceleration	>5 g's all axes		
Attitude (all axes)	Unlimited (DVL data available between $\pm 30^\circ$ roll and pitch)		
Outputs, Digital	RS-422, RS-232		
Cooling	Conduction to water		
Environmental Requirements	Per MIL-STD-167-1 and IEC 1010		
Temperature Operating	-5°C to +45°C (-40°C to +55°C INS, -5°C to +45°C DVL)		
Temperature Storage	-30°C to +60°C		

PHYSICAL CHARACTERISTICS	
Dimensions	18 x 9 inch cylinder (45.7 x 23.0 cm)
Weight: (KN-6051) 3,000 m housing	77 lbs (35 Kg) (57 lbs [25.9 Kg] in water)
(KN-6052, KN-6053) 1,000 m housing	50 lbs (22.7 Kg) (30 lbs [13.6 Kg] in water)
(KN-6052, KN-6053) 3,000 m housing	80 lbs (36.4 Kg) (60 lbs [27.3 Kg] in water)
(KN-6052, KN-6053) 6,000 m housing	95 lbs (43.2 Kg) (70 lbs [31.8 Kg] in water)
Power (20 to 40 V dc)	50 Watts average (@ 32 V dc)
Maintenance	Replace desiccant bag prior to deployment No special equipment required
Calibration Interval	None

#### Notes:

\*Performance operating ranges and characteristics are tailorable for specific applications.

\*\*Assumes GPS aiding. (Selective Availability off for C/A code GPS receivers)

\*\*\*Underwater vehicle performance assumes GPS or Sonar/Doppler bottom-track aiding while aligning at surface and Sonar/Doppler bottom-track aiding while under water.

\*\*\*\*Circular Error Probable Rate (CEPR), Distance Traveled (DT)

*This datasheet is for reference only, Specifications are subject to change*

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