

HiPAP®350



The HiPAP family of underwater positioning systems lets you choose the right system level for your application. HiPAP 350 has been developed to provide the market's best accuracy where HiPAP 500 extreme accuracy and longrange capabilities are not required. With this unique transducer array, measuring only 320 mm in diameter (and thus smaller than HiPAP 500), the HiPAP 350 can be used with all existing HPR gate valves.

Specifications

Product	HiPAP®350
Country of origin	Norge
Manufacturer	Kongsberg Discovery

Acoustic beam pointing control

The HiPAP 350 uses the unique technology of narrow pointing beams. This minimizes the effect of noise from propellers and thrusters. This technology gives the system maximum Signal-to-Noise ratio, and this is the major key to successful acoustic performance. The curved transducer creates a narrow beam pointed towards the transponder(s) within a large sector below the vessel. Outside this sector, the pointing beam will increase in width. Data from roll, pitch and heading sensors are used to compensate for vessel movements.

Super-Short base line functionality

The Super-Short Base Line (SSBL) principle has the obvious advantage that it only requires installation of one hull-mounted transducer and one subsea transponder to establish a three-dimensional position of the transponder. To provide this position, the SSBL system measures both the horizontal and vertical angles, as well as the range to the transponder.

Long base line functionality

At some point of range, depending on the application, the SSBL principle will have accuracy limitation. Long Base Line (LBL) accuracy is independent of range. An LBL system can position more accurately, but only within an array of seabed transponders. The HiPAP with the optional LBL features is a very flexible system combining the advantages of both the SSBL and LBL principles. The HiPAP has better long range performance than traditional wider beam systems. This is because the Signal-to-Noise ratio of the detected seabed transponders' replies are higher than when using one wide beam that needs to cover the seabed footprint of a transponder array.

Multi vessel positioning

The Multi-User LBL (MULBL) function enables several individual vessels and ROV units to position themselves using the same seabed transponder array.

LBL for subsea construction

Kongsberg Simrad introduced the LBL system in 1992, and has since become the market leader in supplying LBL and combined LBL / SSBL systems for vessel positioning. The current LBL systems use intelligent, instrumented transponders and deep water transceivers and transducers. These are all rated for 3000 m water depth, and fulfil any requirements within subsea construction, survey and metrology.

Accuracy a function of transducer size

Accuracy is always dependent on the beam width and the “active surface” of any transducer. The HiPAP 350 will therefore have some reduced performance compared to the more accurate HiPAP 500 which has several more transducer elements.

Automatic compensation for ray bending and sound velocity errors

The HiPAP takes input of the local sound velocity profile, calculates, error compensates and displays the effect of the physical phenomena of sound velocity differences in the water column.

“World Record” in transponder channels

The HiPAP systems can operate with up to 56 transponder channels, and feature transponder telemetry communication for use with transponder release, sensor readings and all LBL functionalities.

Typical applications

The HiPAP 350 has been developed for use in situations where positioning is within a sector of +/-60 degrees below the vessel, but will also perform outside this sector at some reduced accuracy and range capability. This level of functionality makes the HiPAP 350 ideal for drill-rigs, ROV tracking and dynamic positioning reference. It is also ideal for other operations where the underwater positioning is relatively directly below, and where extreme accuracy, shallow water horizontal positioning and ultra deep performance are not required.

HiPAP 350 - ideal for HPR upgrades

The HiPAP 350 system is without question the ideal solution for upgrade of older HPR systems. With it's small diameter, the HiPAP 350 transducer can be used with all HPR system gate valves, and may also be installed on the existing hull units to replace the HPR transducer. The upgrade is limited to a minimum of cabling and work.

Typical HiPAP® 350 configuration

The HiPAP® 350 system operates with the transducer mounted on a hull unit. Several hull unit models are available, these enable the transducer to be lowered approximately 1.5 to 5.5 m below the keel. A Transceiver Unit containing the transmitter, preamplifier and beamforming electronics is mounted close to the hull unit. The system can be configured with one or two hull mounted transducers. The use of two transducers will increase accuracy and redundancy. The system operation is performed on a Windows XP® based operator station.

Basic Specifications

Gate valve size required	350 mm (14 inches)
Transducer diameter	320 mm
Acoustic operating area	+/- 60° (Recommended)
Number of active elements	46
Angle accuracy:¹⁾	0 dB S/N: 0.40° 10 dB S/N: 0.23° 20 dB S/N: 0.18°
Range detection accuracy¹	< 20 cm
Typical operating range¹	1 to 3000 m
Narrow pointing receiver beam	+/- 7.5°

HiPAP 350 standard features

56 transponder channels
 Hull unit for transducer deployment
 Windows XP® based operating system
 Receive frequency band: 27,0 – 30,5 kHz
 Telemetry frequency band: 24,5 – 27,0 kHz
 Transmit frequency band: 21,0 – 24,5 kHz
 Comprehensive on-line help
 Automatic transducer alignment calibration
 Compensation for ray-bending
 Display of ray-bending
 External Depth sensor interface
 Position and angle alarm limits
 Responder mode
 Telegram output to dynamic positioning system
 Telegram output to survey system
 Transponder Telemetry for full utilization
 DGPS Interface

HiPAP 350 optional features

Beacon Mode
 Compass Transponder Mode
 Depth Sensor Transponder Mode
 Inclinator Transponder Mode
 Long Base Line (LBL) functionality
 Geographical LBL Calibration
 Multi-User LBL functionality (MULBL)
 Operator Station Master / Slave function
 Blow Out Preventer (BOP) telemetry function
 Offshore Loading Telemetry function
 Submerged Turret Loading function
 Fast LBL Transponder Positioning mode *
 LBL Accurate Metrology mode*
 (* standard in LBL function)