

April 2017

PORTABLE ACOUSTIC POSITIONING SYSTEM

The μPAP is a portable system designed for tracking ROV's, tow fish, divers and other subsea objects.

μPAP is a small and compact acoustic positioning system designed for operation from a surface vessel to track ROV's, tow fish, divers and any other subsea object at several thousand meters range. The system operates in SSBL mode where it measures the distance and direction to subsea transponders and computes a 3D position in local coordinates or in geographical coordinates.

μPAP is designed to be a portable system for easy installation on surface vessels or other surface units. APOS, the operator station for μPAP®, provides the full range of functions for acoustic positioning and data communication. μPAP benefits from the Cymbal acoustic protocol and all functions that are available for the HiPAP products are also available for μPAP.

μPAP has full LBL calibration and positioning capabilities and can be used for position box in, calibration and positioning. The system is offering the user a wide range of transponder channels and cNODE® transponder models for depths down to 4000 meters.

μPAP has built in motion sensors for compensating the position for vessels roll and pitch movements. These models have no need for calibration of roll and pitch alignments but need to calibrate for alignment to the

vessels' gyro compass. The system can be interfaced to the vessel heading sensor and GNSS system. Data output to users are available in established formats.

The μPAP 201-MGC contains a motion sensor and a gyro compass. This model has no need for calibration to determine roll, pitch and heading alignments.

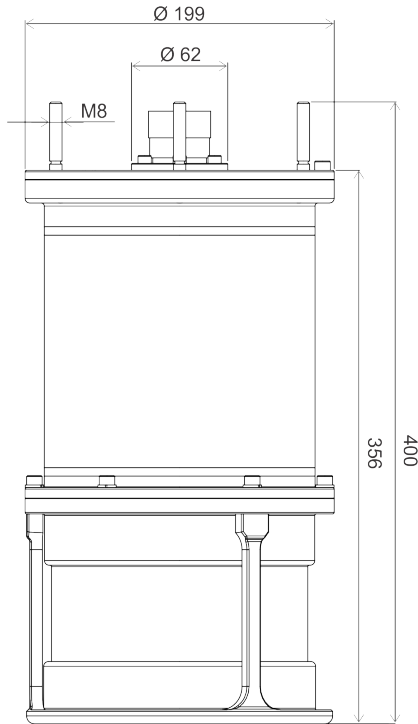
To meet various demands from the market, μPAP® transducer is available in several models with respect to motion sensors and physical size.

- μPAP 200 (Transducer Part No.: 337711)
- μPAP 201-H MRU-H motion sensor (Transducer Part No. 332288)
- μPAP 201-3 MRU-3 motion sensor (Transducer Part No. 337722)
- μPAP 201-2 MRU-2 motion sensor (Transducer Part No. 337717)
- μPAP 201-MGC Motion Gyro Compass (Transducer Part No. 337766)
- μPAP 200 - NEL* (Transducer Part No. 337710)
- μPAP 201-3 – NEL* MRU-3 motion sensor (Transducer Part No. 334422)

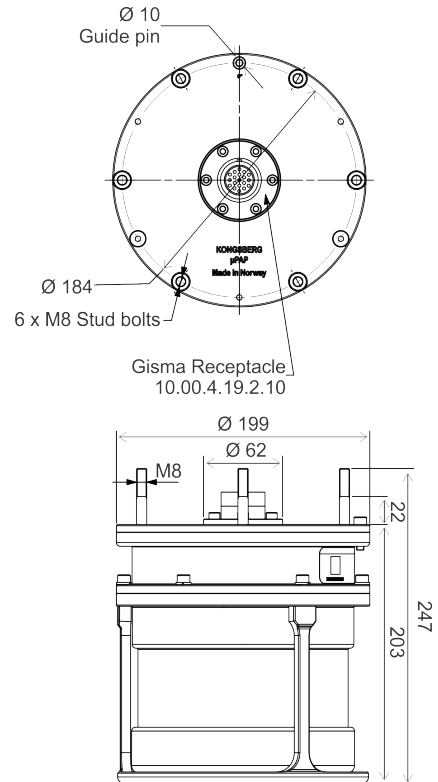
*NEL = No Export Licence required

OUTLINE DIMENSIONS

μPAP 201



μPAP 200



TECHNICAL SPECIFICATIONS

GENERAL

Transponder Channels	All cNODE M channels – 560 unique channels
Operation modes	SSBL, LBL and data telemetry
Transducer cable length	50 m or 70 m
Max deployment depth	100 m
Temperature operational	0°C to +35°C
Temperature storage	-20°C to +70°C
Storage humidity	95% relative (non-condensing)
Vibration Frequency	5-100 Hz
Vibration excitation level	5-13.2 Hz ±1.5 mm, 13.2-100 Hz 1 g
Operational coverage	±90° (see Note 1)
Main coverage	±80° (see Note 1)
Receiver beam	Approx. 22° steerable
201 SERIES	
Total length/diameter	400/190 mm
Weight	16.8 kg
Material	Bronze/Stainless steel
200 SERIES	
Total length/diameter	249/190 mm
Weight	11.7 kg
Material	Bronze/Stainless steel

PERFORMANCE

Operating range, typical	1-4000 m
Operating range, NEL model	1-995 m

Note 1: Operational coverage defines the sector where acoustic positioning and communications are operational. Main Coverage is the sector where maximum range and angular accuracy can be achieved. Outside the main coverage range and elevation angular accuracy are reduced, therefore a depth input for aiding is recommended.

Position accuracy

Model	Motion sensor (°)	μPAP only (°) (1σ)	Total (°) (1σ)	% of range (1σ)
μPAP 201-MGC <small>*Heading accuracy 0.1° secant latitude</small>	>0,01 Range: ±180°	0,25	0,25	0,44
μPAP 201-H	>0,05 Range: ±180°	0,25	0,25	0,44
μPAP 201-3	>0,08 Range: ±45°	0,25	0,26	0,46
μPAP 201-3-NEL	>0,08 Range: ±45°	0,25	0,26	0,46
μPAP 201-2	>0,1 Range: ±25°	0,25	0,27	0,47
μPAP 200	>0,3 Range: ±180°	0,25	0,39	0,68
μPAP 200-NEL	>0,3 Range: ±180°	0,25	0,39	0,68

Specifications subject to change without any further notice. (393495/Revision 1)