



KONGSBERG

μPAP



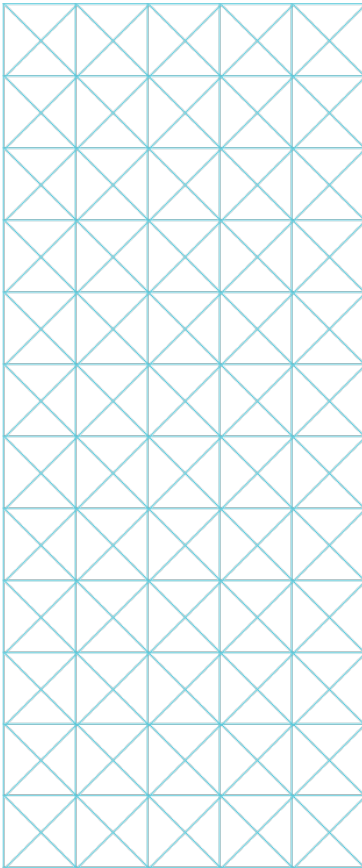
## μPAP PORTABLE ACOUSTIC POSITIONING

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.

- 560 Cymbal Wideband channels
- Modem capability
- SSBL and LBL positioning
- Fast Track mode
- Responder mode
- Integrated motion sensor
- Easy setup
- Electronic beam control
- Compatible to cNODE





## Application

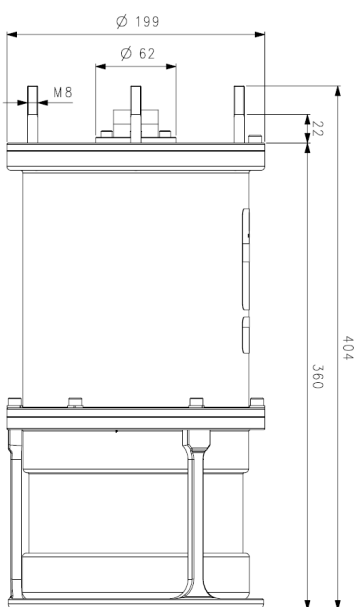
$\mu$ PAP is designed to be a portable system for easy installation on surface vessels or other surface units. APOS, the operator station for  $\mu$ PAP<sup>®</sup>, provides the full range of functions for acoustic positioning and data communication.  $\mu$ PAP benefits from the Cymbal acoustic protocol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

$\mu$ PAP 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<sup>®</sup> transponder models for depths down to 4000 meters.

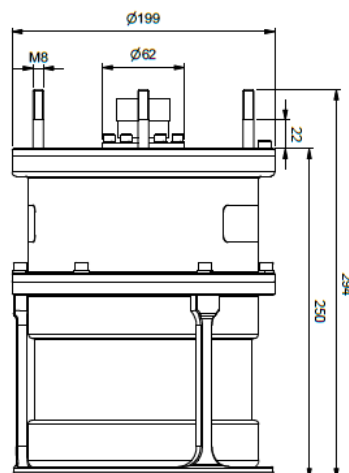
$\mu$ PAP has built in motion sensors for compensating the position for vessels roll and pitch movements. These models have no need for calibration of roll and pitch alignments but need to calibrate for alignment to the vessels' gyro compass. The system can be interfaced to the vessel heading sensor and GNSS system. Data output to users are available in established formats.

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

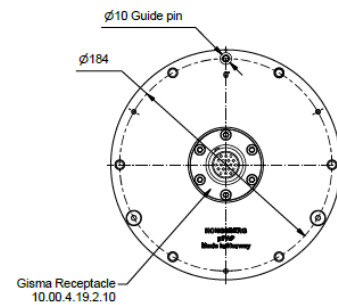
To meet various demands from the market,  $\mu$ PAP<sup>®</sup> transducer is available in several models with respect to motion sensors and physical size.



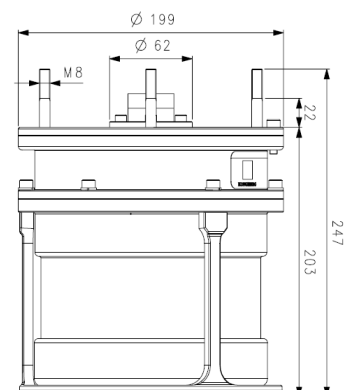
$\mu$ PAP 201



$\mu$ PAP 202



$\mu$ PAP Lid

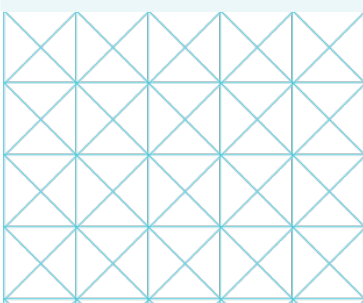


$\mu$ PAP 200



## TECHNICAL DATA

Model	Motion Sensor Accuracy	System Position Accuracy <sup>(1)</sup>
<b>201-MGC-r3</b> Partno.: 337766	R/P: 0.01° H: 0.1° Range ± 180°	0.25° /0.44%, Range: ± 0.02m
<b>201-MGC-r2</b> Partno.:400606	R/P: 0.02° H: 0.2° Range ± 180°	0.25° /0.44%, Range: ± 0.02m
<b>201-H</b> Partno.:332288	R/P: 0.05° Range ± 180°	0.26° /0.45%, Range: ± 0.02m
<b>202-m30</b> Partno.:462804	R/P: 0.08° Range ± 45°	0.26° /0.45%, Range: ± 0.02m
<b>200</b> Partno.:337711	R/P: 0.08° Range ± 180°	0.39° /068%, Range: ± 0.02m



## TECHNICAL DATA – All models

Frequency	20-30 kHz (MF)
Operational coverage <sup>(3)</sup> Main coverage	±90° ±80°
Receiver beam	22°
Source level (re 1μPa)	190dB
Range capability (m) <sup>(2)</sup>	4000+
Navigation Channels	560 Cymbal, 56 FSK, cNODE Compatible
Operation mode	SSBL, LBL, acoustic modem
Transducer cable length	25, 50 or 70m
Transducer deployment depth	< 100m
Temp. operating/Storage	0°C to +35°C/-20°C to +70°C
Storage humidity	95% relative, non-condensing
Vibration	5-100Hz, 5-13.2 Hz ±1.5 mm, 13.2-100Hz 1g
Housing Weight	Bronze/Stainless Steel 201-MGC-r2/r3: 22.6kg 201-H: 16.8kg 202-m30: 200-: 11.7kg



1) Accuracy is in X and Y direction

1) Range capability is depending on line of sight, transponder's transmit power setting, vessel's acoustic system and influence of ambient noise and ray bending.

2) 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

*Specifications subject to change without any further notice.*

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