

cNODE Transponders

Maxi, Midi & Mini

Introduction

cNODE is a family of transponders for underwater acoustic positioning and data link. The transponders operate together with both HiPAP, HPR and cPAP transceivers. cNODE utilises Cymbal acoustic protocol and is compatible with the HiPAP/HPR 400 channels and telemetry. cNODE is designed to cover a large range of applications and this is made possible by the modular design and a variety of different transducers, internal and external sensors, housing materials and other add-on functions.

cNODE is easy to set-up, operate and maintain. Both new configuration and software can be downloaded from TTC 30 without opening the transponders. The floating collar and release design make the launch/recovery operation safe and easy. Spare parts for cNODE are based on the main modules. The cNODE transponder family consists of the models Maxi, Midi and Mini.

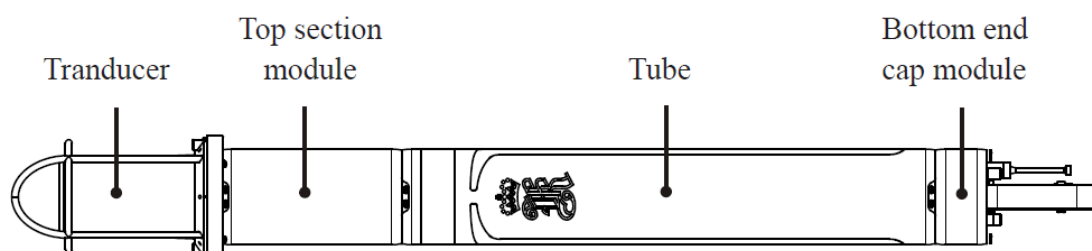


Common for all cNODE transponders

- Operated together with HiPAP, HPR & cPAP transceivers.
- Compatible with both Cymbal acoustic protocol for positioning and sata link, and HiPAP/HPR 400 channels and telemetry.
- SSBL positioning.
- LBL positioning
- Range accuracy of 0,01m between transponders.
- Acoustic data link for command & data transfer
- Both transponder & responder function
- Internal tilt sensor $\pm 90^\circ$
- Pressure relief valve & vent screw (safety devices)
- External connector for transponder configuration & software update via serial line (TTC 30)
- Modular design such that the transducer, transponder electronics, battery pack and optional add-on's can be replaced individually.

cNODE Family:
Maxi 34-30V30H-R (Left)
Midi 34-180 (Middle)
Mini 34-180 (Right)

cNODE modular design



Maxi/Midi – Models & standard features – Examples of models

Depth rating – MF models:	4000m	Maxi 34-180	34-30V-I-St	Midi 34-180
Operating temperature:	-5°C to + 55°C	34-30V30H-Dx-R	34-30V-II-St	34-30V
		34-30V30H-Dx-R	34-30V-St	34-30V30H
		34-30V-Si	34-30V30H-R-St	34-S-R

Transducers

	TD180	TD30V	TD30V30H
			
Frequency band:	Medium Frequency (MF)	Medium Frequency	Medium Frequency
Beam width:	180°	30° vertical	30° vertical/30° horizontal
Receiver sensitivity:	100dB	85d	85dB
Source level – max:	190dB	206dB	206dB/190dB
Material:	Aluminium/Stainless steel	Aluminium/Stainless steel	Aluminium/Stainless steel

Top end caps

Split transducer (S)



Material: Aluminium
Cable length: 6m

Top section modules

Depth sensor (Dx)



High accuracy depth sensor.
Accuracy: 0,01% FS
Material: Aluminium

Multi Sensor Module (Msm)

The module includes the following high accuracy sensors:

- Depth: 0,01% FS
- Inclinator: 0,05 °
- Sound velocity: ± 0.02 m/s

Material: Aluminium

Bottom end cap modules

Basic end cap



Material: Aluminium/stainless steel

Release mechanism (R)



Safe working load: 500kg
Material: Aluminium/stainless steel

Sensor interface (Si)



Interface external sensors
Number of sensors: 3
Serial Line: RS-232/-485/-422
Material: Aluminium

Inclinometer (I)



Internal X & Y inclinometer
Range: ± 60°
Accuracy: 0.25°
Material: Stainless steel

Tubes

Maxi



Material: Aluminium/Stainless steel
Coating: Polyurethane

Midi



Material: Aluminium

Batteries

Maxi



Type: Lithium, non-rechargeable
Battery lifetime
- **Quiescent:** 2.5 years
- **No. of replies:** 0.7 to 11.5 millions

Midi



Type: Lithium, non-rechargeable
Battery lifetime:
- **Quiescent:** 1.25 years
- **No. of replies:** 0.35 to 5.75 millions

External sensors

Floating collar

External Inclinometer (II)



To be used together with Inclinometer (I)
 External X & Y inclinometer
 Range: ± 60°
 Accuracy: 0.25°
 Material: Stainless steel

Examples of other external sensors:

- Sea current sensor
- Temperature sensor
- Pressure sensor
- Heading sensor
- Doppler Velocity Log
- Environmental sensors



Max. operation depth: 4000m
 Safe working load on release unit: 500kg
 Minimum anchor weight: 60kg

Mini – Models & standard features

Depth rating – MF models: 4000m
 Depth rating – LF models: 7000m

Examples of models:
 34-180, 17-180-St, 34-40V & 31-80V-D-St

Transducers

TD180



TD40V



TD80V



TD180LF



Frequency band:	Medium Frequency	Medium Frequency	Medium Frequency	Low frequency (LF)
Beam width:	180°	40° vertical	80° vertical	180°
Receiver Sensitivity	100dB	90dB	85dB	100dB
Source level:	190dB	203dB	188dB	188dB
Material:	Aluminium	Aluminium	Stainless steel	Stainless steel
			Depth rating: 1000m	

Top section modules

Tubes

Bottom end cap modules

Depth sensor (D)



Accuracy: 0.1% FS
Material: Stainless steel



Material: Aluminium/Stainless steel
Coating: Polyurethane



Material: Aluminium/Stainless steel

Battery



Typ: NiMH, rechargeable
Battery lifetime:
 - Quiescent: 60 days
 - No. of replies: 40 000 to 750 000

Battery charger



Battery charger, NiMH

Power AC/DC unit



Input: 110/230 Vac
Output: 15 Vdc/300W
Material: Aluminium

Accessories

TTC 30 – Transponder Test & Configuration unit*

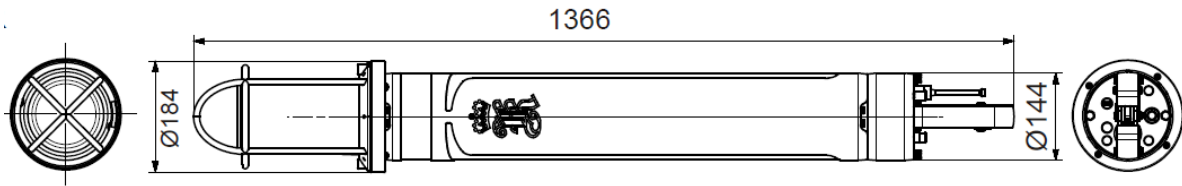
Frequency band: MF
 The unit comes with:
 - Test transducer
 - Serial line cable
 - Mains Power Cable



* See separate TTC 30 Product Specification for more information

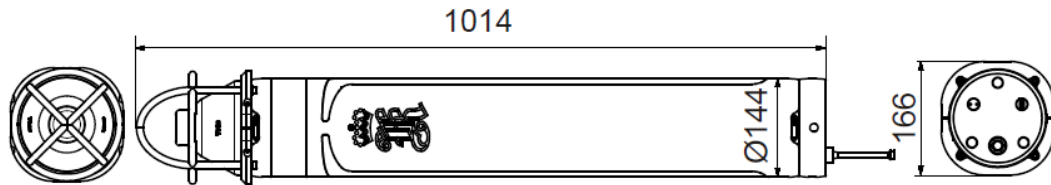
Maxi outline drawings

Maxi 34-30V30H-R



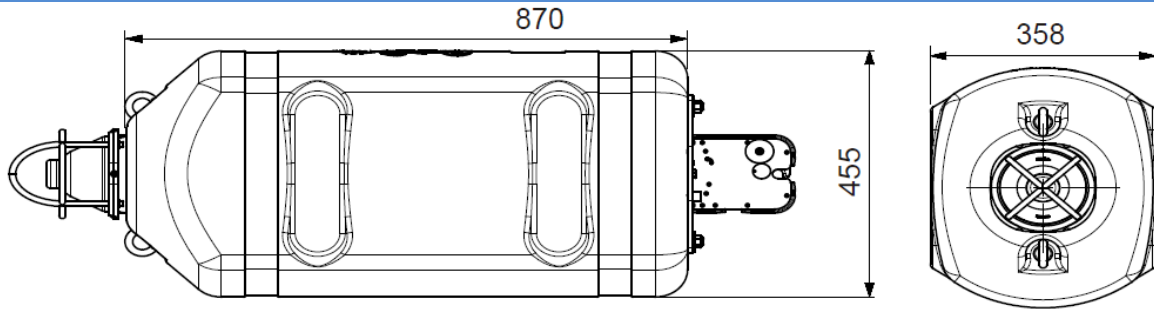
Tube length: 805mm – Weight in air: 30 kg – Weight in water: 13 kg

Maxi 34-180



Weight in air: 28 kg – Weight in water: 12 kg

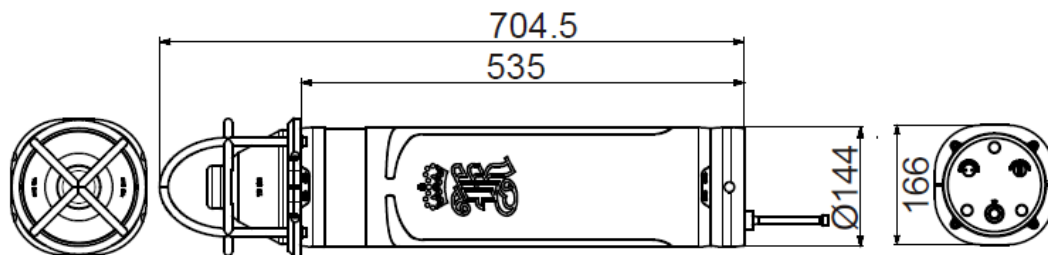
Floating collar outline drawing



Weight in air: 70 kg – Nominal Buoyancy: 30 kg

Midi outline drawing

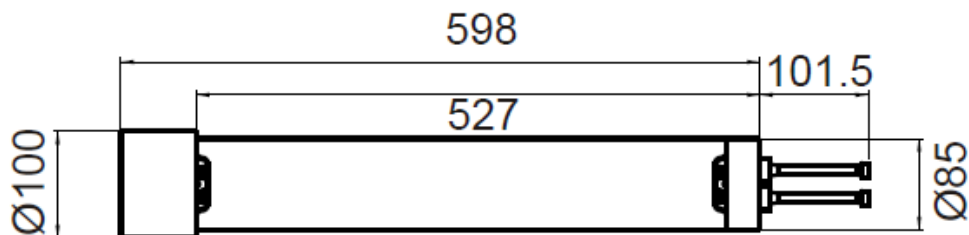
Midi 34-180



Tube length: 495mm – Weight in air: 16.5 kg – Weight in water: 8.5 kg

Mini outline draeing

Mini 34-40V



Tube length: 496mm – Weight in air: 6.7 kg – Weight in water: 3.4 kg