

# cNODE® Transponders

## Maxi, Midi and Mini



KONGSBERG

### 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.

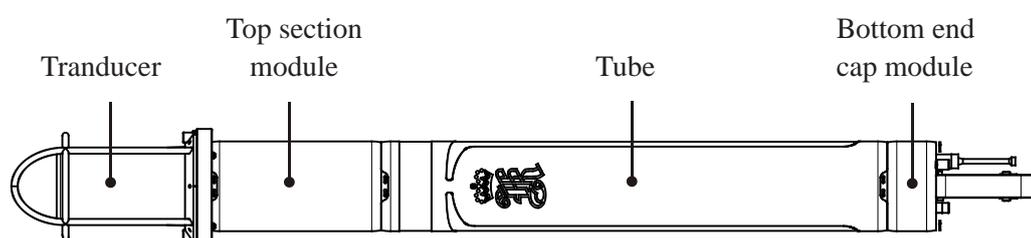
The cNODE® transponder family consists of the models Maxi, Midi and Mini.

### Common for all cNODE® transponders

- Operates together with HiPAP®, HPR and cPAP® transceivers.
- Compatible with both Cymbal® acoustic protocol for positioning and data link, and HiPAP®/HPR 400 channels and telemetry.
- SSBL positioning.
- LBL positioning.
- Range accuracy of 0,01 m between transponders.
- Acoustic data link for command and data transfer.
- Both transponder and responder functions.
- Internal tilt sensor  $\pm 90^\circ$ .
- Pressure relief valve and vent screw (safety devices).
- External connector for transponder configuration and 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 and standard features

### Examples of models:

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

## Transducers

### TD180



<b>Frequency band:</b>	Medium Frequency (MF)
<b>Beam width:</b>	180°
<b>Receiver sensitivity:</b>	100 dB
<b>Source level - max:</b>	190 dB
<b>Material:</b>	Aluminium/Stainless steel

### TD30V



<b>Frequency band:</b>	Medium Frequency
<b>Beam width:</b>	30° vertical
<b>Receiver sensitivity:</b>	85 dB
<b>Source level - max:</b>	206 dB
<b>Material:</b>	Aluminium/Stainless steel

### TD30V30H



<b>Frequency band:</b>	Medium Frequency
<b>Beam width:</b>	30° vertical/30° horizontal
<b>Receiver sensitivity:</b>	85 dB
<b>Source level - max:</b>	206 dB/190 dB
<b>Material:</b>	Aluminium/Stainless steel

## Top end caps

## Top section modules

### Split transducer (S)



**Material:** Aluminium  
**Cable length:** 6 m

### 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:** 500 kg  
**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 and Y inclinometer  
**Range:** ± 60°  
**Accuracy:** 0.25°  
**Material:** Stainless steel

## Tubes

### Maxi



**Material:** Aluminium/  
Stainless steel  
**Coating:** Polyurethane

### Midi



**Material:** Aluminium  
**Coating:** Polyurethane

## 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

### External Inclinometer (II)



- To be used together with Inclinometer (I)

External X and 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

## Floating collar



**Max. operation depth:** 4000 m

**Safe working load on release unit:** 500 kg

**Minimum anchor weight:** 60 kg

## Mini - Models and standard features

### Examples of models:

<b>Depth rating - MF models:</b>	4000 m		
<b>Depth rating - LF models:</b>	7000 m	34-180	17-180-St
<b>Operating temperature:</b>	- 5 °C to + 55 °C	34-40V	31-80V-D-St

## Transducers

### TD180



### TD40V



### TD80V



### TD180LF



<b>Frequency band:</b>	Medium Frequency	Medium Frequency	Medium Frequency	Low Frequency (LF)
<b>Beam width:</b>	180°	40° vertical	80° vertical	180°
<b>Receiver sensitivity:</b>	100 dB	90 dB	85 dB	100 dB
<b>Source level - max:</b>	190 dB	203 dB	188 dB	188 dB
<b>Material:</b>	Aluminium	Aluminium	Stainless steel	Stainless Steel
			<b>Depth rating:</b> 1000 m	

## 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

## Battery charger

## Power AC/DC unit



**Type:** NiMH, rechargeable  
**Battery lifetime:**

- Quiescent:** 60 days
- No. of replies:** 40.000 to 750.000



Battery charger, NiMH



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

## Accessories

### TTC 30 - Transponder Test and Configuration unit\*

**Frequency band:** MF

The unit comes with:

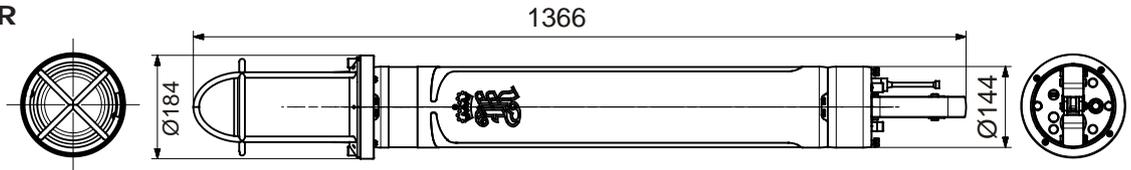
- Test Transducer
- Serial Line Cable
- Mains Power Cable



\* See separate TTC 30 Product Specification for more information.

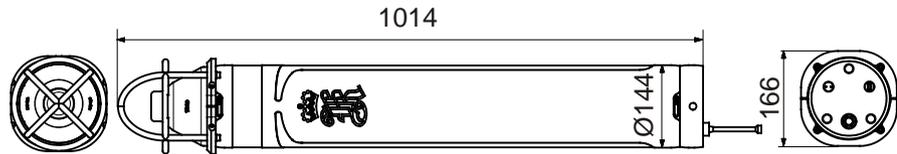
## Maxi outline drawings

### Maxi 34-30V30H-R



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

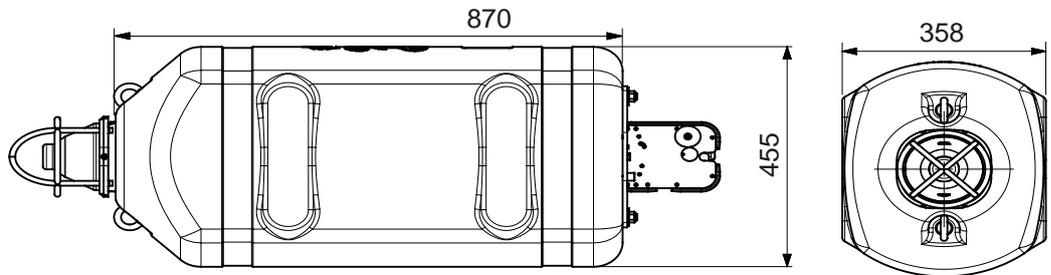
### Maxi 34-180



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

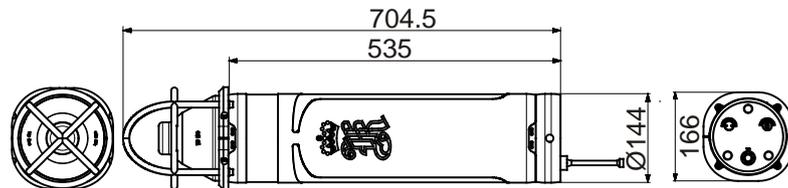
## Floating collar outline drawing

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



## Midi outline drawing

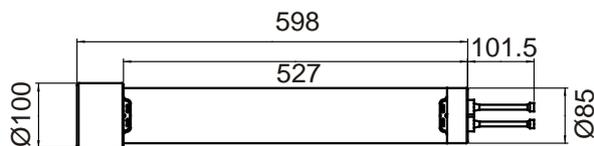
### Midi 34-180



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

## Mini outline drawing

### Mini 34-40V



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

(Cd302048)

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