

SPT & MPT 31 x series

For medium deep water use – 1000 m rated

SSBL Positioning Transponder (SPT)

Multifunction Positioning Transponder (MPT)

Description

The medium frequency transponders, the SPT 31x and MPT 31x series are the sub-sea and seabed elements of the Kongsberg Maritime underwater positioning and navigation systems. The transponder models have 56 channels for use with the HiPAP / HPR systems.

Common for all the models are that they, on interrogation, replies with a single- or a multi-pulse response. This reply contains different information to the HiPAP / HPR system, depending on the present system application.

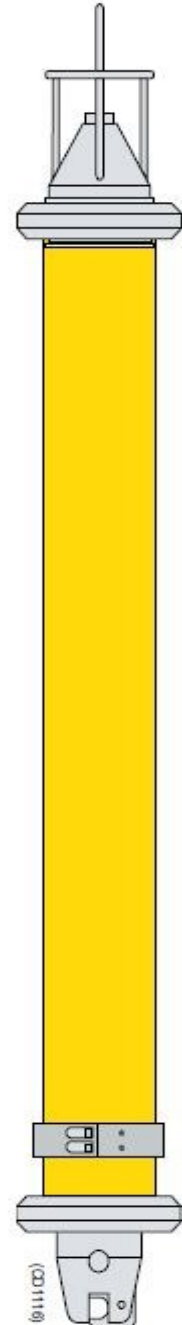
A transponder consists of the following main components:

- Transducer-head
- Battery
- Electronics
- Housing

The transponders are supplied with different transducer heads. The last digit in the model number identifies the width of the beam pattern. The electronics with software is modular for all the models. The housing length is defined by the transponder model.

Features

- Dynamic position reference for surface vessels.
- Navigation of underwater vehicles and towed bodies.
- Positioning aid for pipeline and underwater structure maintenance and construction.
- Positioning and re-entry of BOP's.
- Riser angle and BOP angle monitoring.
- Telemetry of inclinometers, acoustic release or external sensors.
- Sensor-reading telemetry transponder (depth and temperature).
- Position-transponder in an LBL array (MPT only).
- Master-slave transponder in an LBL array (MPT only).
- Transponder Range Positioning mode, where it positions itself (MPT only).
- Range measuring transponder (MPT only)



MPT

The Multifunction Positioning Transponder (MPT) can be operated in both Super-Short Base Line (SSBL) and Long Base Line (LBL) modes. All required telemetry functionality is built-in.

SPT

The SSBL Positioning Transponder (SPT) can only operate in Super-Short Base Line (SSBL). However, the SPT also supports telemetry capabilities and functionality. The SPT may be upgraded to MPT.

Compatibility

The SPT and MPT transponders are not only compatible for use with the HiPAP and HPR 400 systems. They can also be used by the HPR 309 / 310, and former models with the original 14 channels. The channel is preset at delivery, but can be altered by adjusting internal switches, or by acoustic telemetry from the HiPAP / HPR 400 system. HPR 309 / 310 and former systems can not send telemetry for this purpose.

Special facilities

The acoustic telemetry link may be used to:

- Set the transponder into different modes of operation.
- Transfer data from the transponder.
- Set the transponder receiver sensitivity and transmitter power level. This is used to achieve optimal performance and battery lifetime.
- Read remaining battery life-time.
- Change the pulse length and turnaround delay.

Mounting and handling

The transponder may be secured to a subsea structure using mounting brackets, or fitted with an anchor weight and floating collar for location on the open seabed. The unit is designed for Remotely Operated Vehicle (ROV) manipulator handling.

Power supply

All models are normally self-contained with power supply. A lithium battery is used to ensure long life. As an option, a transponder may be externally powered. The lithium battery L10/36 (18/30) can be replaced with a rechargeable battery with battery charger, or an Alkaline battery.

Housing material

The housing material is n-dized aluminium with polyurethane coating.

Naming principles

The transponder name contains three letters followed by three digits, and the letters after the digits describes the options.

MPT= Multifunction Positioning Transponder

SPT = SSBL Positioning Transponder

3xx = 30 kHz band

x1x = Depth rated for 1000 m

xx9 = +90° beamwidth

xx4 = +45° beamwidth

xx3 = +30° beamwidth

DT = Depth and Temperature sensors

I = Inclinometers (X and Y angles)

R = Release mechanism

H = Heading magnetic compass

S = Unit with Split transducer

Si = Serial Interface

Mounting and handling

The transponder may be secured to a subsea structure using mounting brackets, or fitted with an anchor weight and floating collar for location on the open seabed. The unit is designed for Remotely Operated Vehicle (ROV) manipulator handling.

Models

- SPT 314
- SPT 314/R
- SPT 314/I
- SPT 319
- SPT 319/R
- SPT 319/H
- SPT 319/I
- SPT 319/S
- MPT 313
- MPT 313/S
- MPT 313/H
- MPT 313/R
- MPT 313/RS
- MPT 313/SiH
- MPT 319
- MPT 319/DT
- MPT 319/R
- MPT 319/DTR
- MPT 319/SiH

Technical Specifications

Basic data

- Maximum depth rating: 1000 m
- Housing material: Aluminium
- Coating: Polyurethane
- Weight in air: approx. 26 kg
- Weight in water: approx. 10 kg
- Housing diameter: 131 mm
- Clamping ring diam: 171 mm
- Overall length: 1420 mm
- Transducer beamwidth: $\pm 90^\circ / \pm 45^\circ / \pm 30^\circ$ (depending on model)
- Operating temp: 0°C to $+30^\circ\text{C}$

Version /R and DTR

- As in basic data, except:
- Weight in air: 27 kg
 - Weight in water: 11 kg
 - Overall length: 1470 mm
 - Maximum release load: 225 kg
 - Release battery: 400 releases

Version /I

As in basic data and DT, except:

Maximum detectable angle:

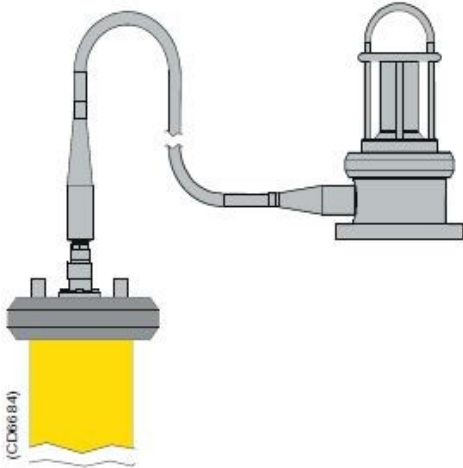
- HPR 300 channels: $\pm 15^\circ$
- HPR 400 Channels: $\pm 60^\circ$

Resolution:

- HPR 300 channels: 0.25°
- HPR 400 channels: 0.02°
- Accuracy w/standard sensors: 0.25°

Version /S

The Split housing and transducer transponder (S), has separate electronics unit housing) and transducer unit. The transducer unit has a 5 m long cable, for electronics unit connections



Transducer unit:

- Weight in air: 12 kg
- Weight in water: 5 kg
- Overall length: 327 mm

Electronic unit:

- Weight in air: 27 kg
- Weight in water: 11 kg
- Overall length: 1247 mm

Source level

(relative to 1 μPa . ref 1 m):

- $\pm 90^\circ$, 4 steps: max 188 dB
- $\pm 45^\circ$, 4 steps: max 195 dB
- $\pm 30^\circ$, 4 steps: max 192 dB

Rx sensitivity, 2 steps:

- max 100 dB relative to 1 μPa

Frequency bands:

- Rx: 21.000 - 24.500 kHz
- Telemetry: 25.000 - 26.500 kHz
- Tx: 27.000 - 31.500 kHz

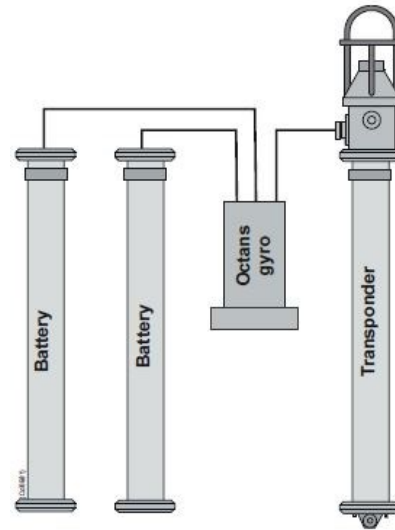
Version /SiH

The SiH transponder together with the Octans gyro module and two subsea battery units (two L24), are a high performance true-north seeking gyrocompass, that takes no influence from magnetic fields. The transponder and the Octans gyro module are connected by a serial line (RS-232) in a subsea cable.

The subsea battery units and the Octans module are connected by subsea cables.

The four units can be assembled on an extension-shaft with candelabrum.

- Octans fibre optic gyrocompass is a true-north seeking gyrocompass
- Magnetic compass is for backup



Transponder:

- Weight in air: 32 kg
- Weight in water max: 18 kg
- Overall length max: 1500 mm

Subsea battery unit (L24):

- Weight in air: 24.5 kg
- Weight in water: 10 kg
- Overall length: 1247 mm
- Voltage: 24 Vdc
- Capacity: 168 Ah

Octans module:

- Length: 406.5 m
- Diameter: 279 mm

Version /DT

As in basic data, except:

DT sensor

- Max depth: 1000 m
- Accuracy / pressure: ± 1 m
- Resolution/ pressure: 0.1 m
- Range: -10°C to $+40^\circ\text{C}$
- Accuracy / temp: 0.2°C
- Resolution / temp: 0.1°C

Version /H

The SPT 319/H, is a Compass transponder. The compass behaves like a magnetic compass. It is designed to be used on a rotating subsea structure. It reports the compass angle by telemetry or by pulse positioning. The implemented compass also contains a roll and pitch sensor.

As in basic data, except:

Compass TCM2-20-TTL:

- Heading: Accuracy level: $\pm 1.0^\circ$ RMS Resolution / repeatability: $0.1^\circ / \pm 0.1^\circ$

The heading specifications may be obtained after calibration, but only if all the magnetic anomalies have been cancelled out by the calibration.

Tilt:

Can be read by use of telemetry.

Range: $\pm 20^\circ$

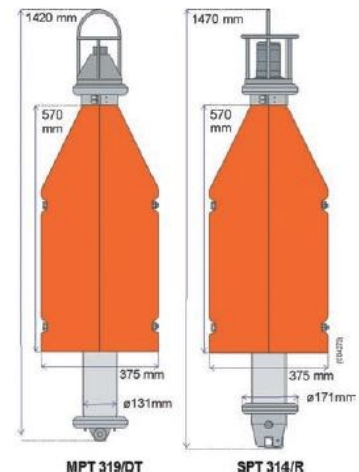
Accuracy: $\pm 0.2^\circ$

Resolution / repeatability:

$0.1^\circ / \pm 0.2^\circ$

Floating collar

- Collar type: 119-086872
- Depth rating: 1000 m
- Total weight in air: 30 kg
- Total buoyancy in water: 28.5 kg
- Overall height: 570 mm
- Diagonal diameter: 535 mm
- Colour: orange



MPT 319/DT

SPT 314/R

Batteries

The L10/36 (18/30) battery pack may be replaced by an Alkaline or a Rechargeable battery. The specifications for the batteries are shown in the table.

Battery data	Lithium	Alkaline	Rechargeable
Battery Type no	L10/36 (18/30)	A10/36 (24/24)	N10/36 (18/30)
Battery Part no	290-101665	290-216804	290-212364
Maximum continuous on-time	185 days	71 days	16 days
Quiescent time	1045 days	301 days	90 days
No. of replies, low source level	19.6 million	5.4 million	1.44 million
No. of replies, max source level	4.9 million	1.1 million	0.36 million

Lithium

- Shelf lifetime: 10 years
(More data, see table above)

Alkaline

- Shelf lifetime: 4 years
(More data, see table above)

Rechargeable

- Number of charge / discharge cycles: 250
(More data, see table above)

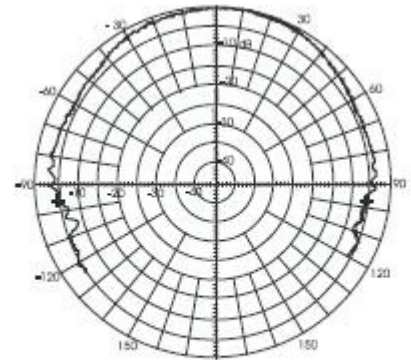
Battery Charger

- Type: BCN 1036
- Weight: 3.5 kg
- Outline dim: 172x20x231 mm

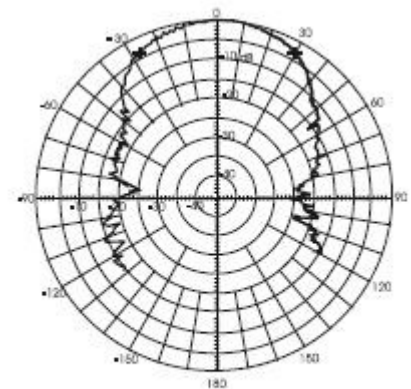
Beam pattern

The transponder beam pattern shows the transmit / receive sensitivity in the different directions.

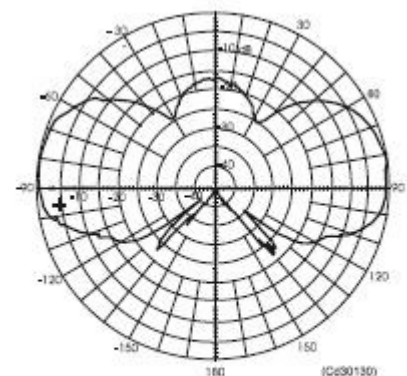
The MPT 313 transponder series is equipped with a $\pm 30^\circ$ beamwidth transducer. This transducer is “doughnut-shaped”, and provides a horizontal beam.



MPT 319 series
SPT 319 series
Source level = 188 dB



SPT 314 series
Source level = 195 dB



MPT 313 series
Source level = 194 dB (Horizontal)