



KONGSBERG

SPT and MPT 31x Series

SSBL Positioning Transponder (SPT) Multifunction Positioning Transponder (MPT)

Medium deep water use - 1000 m rated

Introduction

The medium frequency **Kongsberg Simrad SPT 31x** and **MPT 31x Series** of transponders are the subsea and seabed elements of the Kongsberg Simrad underwater positioning and navigation systems. The transponder models have 56 channels for use with the HiPAP systems and the HPR Series.

Common for all these 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 current application.

Applications

- 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).

Units and options

The transponder consists of the following main components:

- Transducer head
- Battery
- Electronics
- Housing

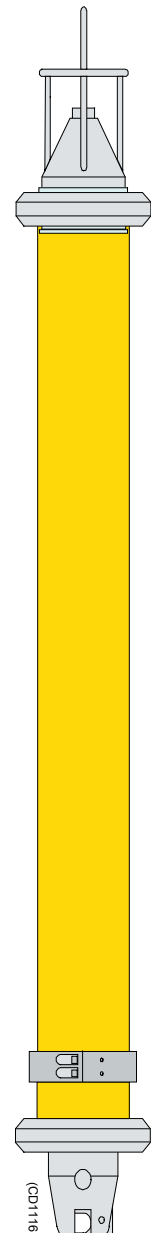
The transponders are supplied with different transducer heads. The last digit in the model number identifies the \pm width of the beam pattern. The electronics with software is modular for all the models. The housing length is defined by the transponder model.

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. 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 systems and HPR 400 Series. They can also be used by the HPR 309/310, and former models with the original 14 channels. The channel is preset from factory, 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 lifetime.
- 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 buoyancy 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. A rechargeable battery with battery charger and an Alkaline battery are available. These batteries may be used

as a replacement for the transponder battery, L10/36 (18/30).

Housing material

The housing material is anodized 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 meters

xx9 = $\pm 90^\circ$ beamwidth

xx4 = $\pm 45^\circ$ beamwidth

xx3 = $\pm 30^\circ$ 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

Models

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

Basic data

Technical specifications

Maximum depth rating..... 1000 meters

Housing material..... Aluminium

Coating..... Polyurethane

Weight in air / water..... 24 kg / 10 kg

Outside diameter:

- Housing / Clamping ring..... 131 mm / 171 mm

- Overall length..... 1420 mm

Transducer beamwidth..... $\pm 90^\circ$ or $\pm 45^\circ$

Source level:

- $\pm 90^\circ$, 4 steps: max 188 dB relative to 1 μ Pa. ref. 1m

- $\pm 45^\circ$, 4 steps: max 195 dB relative to 1 μ Pa. ref. 1m

- $\pm 30^\circ$, 4 steps: max 192 dB relative to 1 μ Pa. ref. 1m

Rx sensitivity, 2 steps: max 100 dB relative to 1 μ Pa

Frequency bands:

- Rx 21.000 - 24.500 kHz

- Telemetry..... 25.000 - 26.500 kHz

- Tx 27.000 - 31.500 kHz

Version /DT

Basic data applies with the following exceptions:

DT sensors; max depth..... 1000 m

Accuracy/ pressure sensor..... ± 1 m

Resolution pressure sensor..... 0.1 m

Range temperature sensor -10° to $+40^\circ$ C

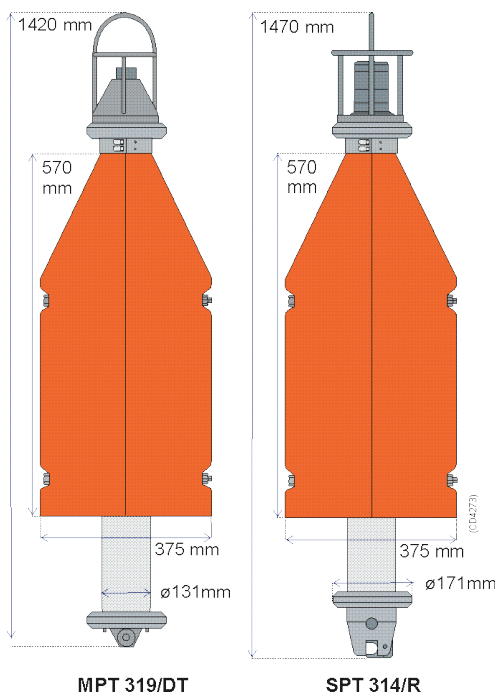
Accuracy temperature sensor 0.2° C

Resolution temperature sensor 0.1° C

Version /R and DTR

Basic data applies with the following exceptions:

Weight in air / water.....	27 kg / 11 kg
Overall length.....	1470 mm
Release; lift / buoyancy.....	225 kg
Separate battery pack.....	400 releases



Version /I

Data as basic and DT except:

Maximum detectable angle:

- HPR 300 channels..... ±15°
- HPR 400 channels..... ±60°

Resolution:

- HPR 300 channels 0.25°
- HPR 400 channels..... 0.02°

Accuracy with standard sensors..... 0.25°

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 puls positioning. The implemented compass also contains a roll and pitch sensor.

Specifications as for basic unit except:

Compass..... TCM2-20-TTL

Heading: (Note A)

- Accuracy level ±1.0° RMS
- Resolution / repeatability..... 0.1° / ±0.1°

Tilt: (Note B)

- Tilt..... ±20°
- Accuracy ±0.2°
- Resolution / repeatability 0.1° / ±0.2°

Note A: This specification may be obtained after calibration, but only if all the magnetic anomalies have been cancelled out by the calibration.

Note B: Can be read by use of telemetry.

Version /Si

The MPT 319/Si is designed to interface the Subsea Sensor Module SSM 301. The transponder and the SSM 301 are connected by a Serial line (RS-232) and a subsea cable. The SSM 301 and MPT 319/Si together with HiPAP/HPR systems, provides a complete system for subsea monitoring of; Positioning, Orientation and Inclination. The sensor data is displayed on the APOS screen. Refer to separate product description for SSM 301. Basic data except:



Weight in air / water.....	27 kg / 11 kg
Overall length.....	1486 mm

Version /S

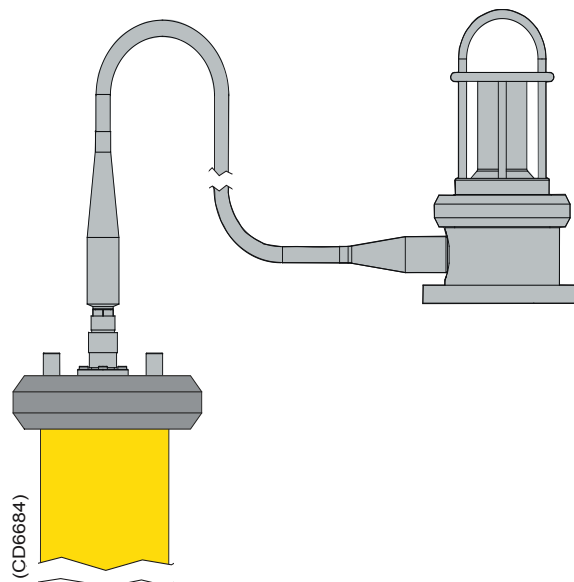
The Split housing and transducer transponder (S), has separate housing (electronics unit) and transducer. The transducer has a 15 m long cable, to connect it to the housing.

Transducer unit:

Weight in air / water.....	12 kg / 5 kg
Overall length.....	327 mm

Electronic unit:

Weight in air / water.....	27 kg / 11 kg
Overall length.....	1247 mm



Technical specifications

Batteries

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

	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	180 days	71 days	80 days
Quiescent time	930 days	301 days	300 days
No. of replies, low source level	6.4 million	1.44 million	0.64 million
No. of replies, max source level	1.6 million	0.36 million	0.16 million

Lithium

Weight 7.6 kg
 Shelf lifetime 10 years
 (For more data see table)

Alkaline

Weight 8.0 kg
 Shelf lifetime 4 years
 Max effect 100 W
 (For more data see table)

Rechargeable

Weight 8.5 kg
 Number of charge / discharge cycles 250
 (For more data see table)

Battery Charger

Type BCN 1036
 Weight 3.5 kg
 Outline dimension 172 x 120 x 231 mm

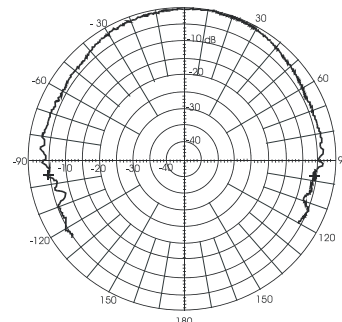
Floating Collar

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
 Width x depth 375 x 375 mm
 Diagonal diameter 535 mm
 Colour orange

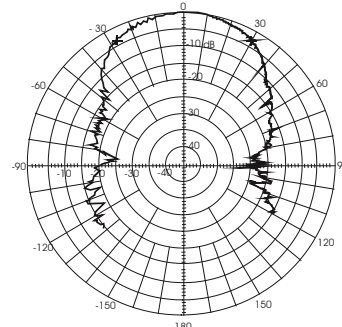
Beam pattern

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

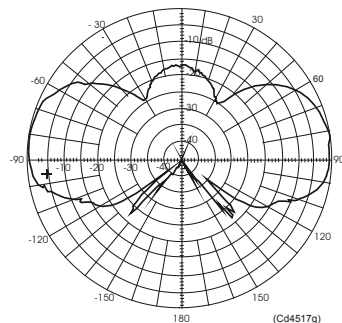
The MPT 313 transponder series is equipped with a $\pm 30^\circ$ beamwidth transducer. This transducer is “doughnut-shaped”, and provides a horizontal beam.



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)

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