

SPT and MPT 33x series



KONGSBERG

SSBL Positioning Transponder (SPT)

Multifunction Positioning Transponder (MPT)

Deep water use - 3000 m rated

Description

The medium frequency SPT 33x and MPT 33x transponders are the subsea and seabed elements of the Kongsberg Maritime underwater positioning and navigation systems. The transponder models have 56 channels for use with the HiPAP and the HPR 400 systems. Common for all the models are that they, on interrogation, will reply with a single- or a multi-pulse response. This reply contains different information to the HiPAP / HPR system, depending on the application.

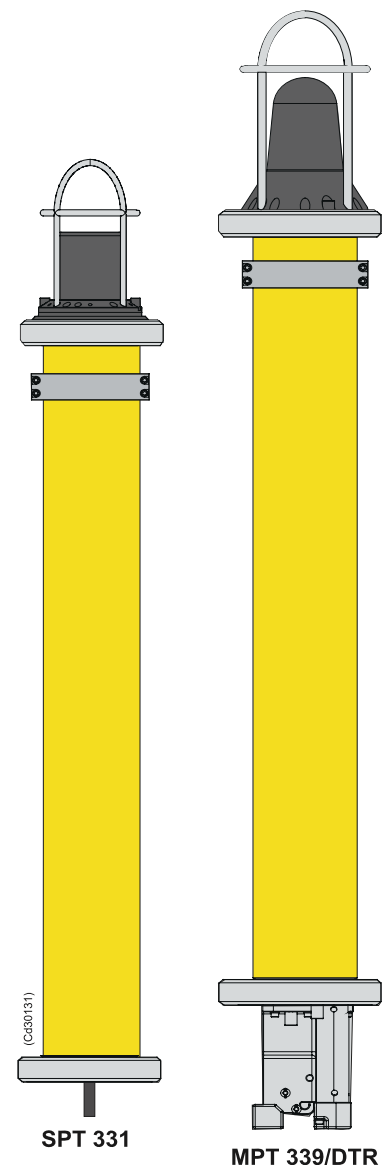
A transponder consists of the following main components:

- Transducer-head
- Battery
- Electronics
- Housing
- Bottom end cap / Release unit

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 Blow Out Preventers (BOPs).
- Riser angle and BOP angle monitoring.
- Telemetry of inclinometers, acoustic release or external sensors.
- Sensor-reading telemetry transponder (depth and temperature).
- Position-transponder in a Long Base Line (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).
- Responder function.



SPT 331

MPT 339/DTR

Aluminium transponders

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.

The unique Dual Beam option

The Dual Beam option is designed for use in Long Base Line deep water positioning. The array calibration is performed with the use of a “doughnut-shaped” beam. When the calibration is completed, this beam will be switched off and the transponder will then only operate with the $\pm 15^\circ$ beam upwards. This saves battery energy, extending the transponder’s lifetime.

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 lifetime.
- Change the pulse length and turnaround delay.
- Acoustic release.

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 (15/40) can be replaced with a rechargeable battery with battery charger, or an Alkaline battery.

Housing material

Standard housing material is anodized aluminium with polyurethane coating. Units with stainless steel housing are available. For Stainless steel units, the abbreviation “St” is added to the transponder name. Both types of units are very robust.

Release units

A Release (R) transponder is a recoverable unit fitted with an automatic release mechanism. When fitted, the release unit forms the transponder end cap. The release mechanism is reset at the surface, and you can use the same unit many times in different areas. The anchor weight will be lost during the release operation, so it will require replacement every time.

Naming principles

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

MPT = Multifunction Positioning Transponder

SPT = SSBL Positioning Transponder

3xx = 30 kHz band

x3x = Depth rated for 3000 m

xx1 = $\pm 15^\circ$ beamwidth

xx9 = $\pm 90^\circ$ beamwidth

DT = Depth and Temperature sensors

R = Includes Release mechanism

DuB = Dual Beam

I = One set Inclinometers (X/Y angles)

II = Split unit with two sets of Inclinometers (X/Y angles)

RspSx

110 Vac = Responder, Short tube, small backup battery/ external 110 Vac supply

St = Stainless steel (housing)

Models

SPT models:

- SPT 331
- SPT 331/R
- SPT 331/St
- SPT 331/R-St
- SPT 331/I-St
- SPT 331/II-St
- SPT 331/RspSx110 Vac-St
- SPT 331/RspSx 110 Vac

MPT models:

- MPT 331/DTDuB
- MPT 331/DTRDuB
- MPT 331/DTDuB-St
- MPT 331/DTRDuB-St
- MPT 339/DT
- MPT 339/DTR
- MPT 339/St
- MPT 339/DTR-St
- MPT 339/DTRspSx 110 Vac-St

Basic data

- Maximum depth rating: 3000 m
 - Housing material:
Aluminium / Stainless steel
 - Aluminium unit:
Protective coating: Polyurethane
Weight in air: 35.5 kg
Weight in water: 13.5 kg
 - Stainless steel unit:
Weight in air: 60 kg
Weight in water: 42 kg
- Overall length: 1101-1850 mm
- Outside diameter:
Aluminium unit, Housing /
Flange: 138 mm / 200 mm
Stainless steel unit, Housing /
Flange: 125 mm / 178 mm
 - Transducer beamwidths:
 $\pm 90^\circ / \pm 15^\circ$
(depending on model)

Source level

(relative to 1 μ Pa. ref1 m):

- $\pm 15^\circ$, 4 steps: max 206 dB
- $\pm 90^\circ$, 4 steps: max 195 dB

Rx sensitivity, 2 steps

(HIGH/LOW):

- 100/106 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/R and /DTR

As in basic data, except:

- Aluminium unit:
Weight in air: 38 kg
Weight in water: 13 kg
- Stainless steel unit:
Weight in air: 65 kg
Weight in water: 46 kg
- Overall length: 1613 -1850 mm
- Maximum release load:
Aluminium unit: 250 kg
Stainless steel unit: 140 kg
- Release battery St: 1000 releases

Sensor:

- Max depth on sensor: 3000 m
Resolution/Accuracy:
0.1 m / < 0.1%
- Temp range: -5° C to $+30^\circ$ C
Resolution/Accuracy:
0.1 $^\circ$ C / 0.2 $^\circ$ C

Version/RspSx 110 Vac

As in basic data, except:
Combined responder and transponder. Normally powered by 110 Vac. It turns into transponder mode with backup battery if 110 Vac power is lost. The unit comes with a 1 m pig-tail with "Gisma" U-connector.

- Aluminium unit:
Weight in air: 25 kg
Weight in water: 10 kg
- Stainless steel unit:
Weight in air: 45 kg
Weight in water: 33 kg
- Overall length: 1101-1140 mm
- Maximum power consumption:
110 Vac / 7.5 W

Version/I

As in basic data, except (only St):

- Maximum detectable angles:
HPR 300 mode: $\pm 15^\circ$
HPR 400 mode: $\pm 60^\circ$
- Resolution:
HPR 300 mode: 0.25 $^\circ$
HPR 400 mode full telemetry:
0.02 $^\circ$
- Accuracy, standard sensors:
0.25 $^\circ$

Version/II

As in basic and version/ I data, except (only St):

Two units, each with one set of inclinometers, and with a 9 meter interconnecting cable.

- Weight in air:
Transponder unit: 60 kg
Inclinometer unit: 20 kg
- Weight in water:
Transponder unit: 42 kg
Inclinometer unit: 18 kg
- Outside diameter:
Housing: 125 mm
Flange: 178 mm
- Overall length:
Transponder: 1630 mm
Inclinometer unit: 225 mm

Version/DuB

As in basic data, except:

- Aluminium unit:
Weight in air: 38 kg
Weight in water: 14 kg
- Stainless steel unit:
Weight in air: 62 kg
Weight in water: 41 kg
- Overall length: 1695-1731 mm

Transducer beamwidth

Dual Beam (DuB):

- Vertical: $\pm 15^\circ$
- Horizontal: $\pm 15^\circ$

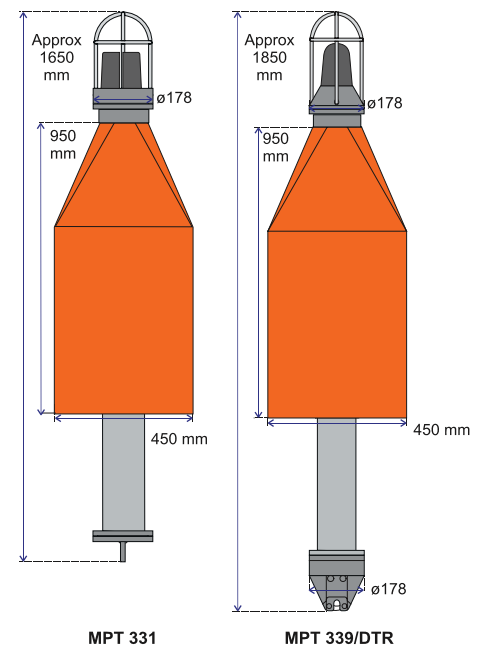
Source level

(relative to 1 μ Pa. ref1 m):

- Vertical, 4 steps: max 206 dB
- Horizontal, 4 steps: max 190 dB

Floating collar

- Reg. no: 119-086645
- Depth rating: 3000 m
- Total weight in air:
approx 77 kg
- Total buoyancy in water:
approx 65 kg
- Overall height: 950 mm
- Colour: orange



Batteries

The L10/36 (15/40) battery pack may be replaced by an Alkaline or a Rechargeable battery. The specification for the batteries are shown in the table.

Battery data	Lithium	Alkaline	Rechargeable
Battery Type	L10/36 (15/40)	A10/36 (24/24)	N10/36 (18/30)
Battery Part no	290-103053	290-216804	290-212364
Maximum continuous on-time	180 days	71 days	16 days
Quiescent time	930 days	301 days	90 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

SPT 331/MPT 331

Battery type: L10/36 (15/40)
(More data, see table above)

SPT 331/RspSx 110 Vac

Battery

- Type: L10/40 (3/11)
- Reg. no: 290-102726
- Maximum continuous on-time: 30 days
- Quiescent time: 155 days
- No. of replies, low source level: 1.68 million
- No. of replies, max source level: 0.42 million

MPT 339/DTRspSx 110 Vac

Battery

Same as SPT 331/RspSx 110 Vac

MPT 339 series

Battery

- Type: L10/50 (12/42)
- Reg. no 290-089592
- Maximum continuous on-time: 120 days
- Quiescent time: 620 days
- No. of replies, low source level: 5.6 million
- No. of replies, max source level: 1.4 million

Lithium

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

Alkaline

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

Rechargeable

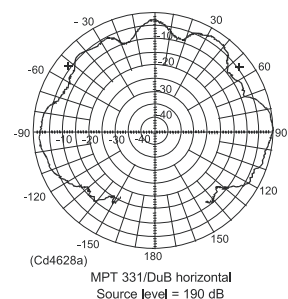
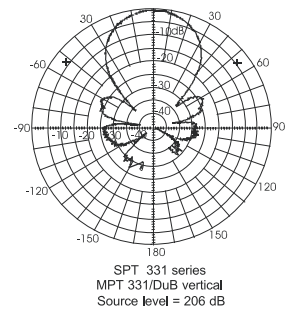
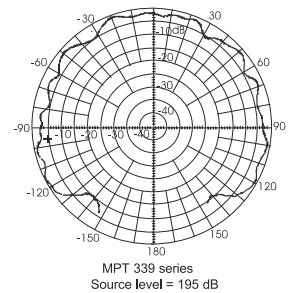
- Number of charge / discharge cycles: 250
(More data, see table above)

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.



855-160760 / Rev.K / May 2006

Kongsberg Maritime AS

Strandpromenaden 50
P.O.Box 111
N-3191 Horten,
Norway

Telephone: +47 33 02 38 00
Telefax: +47 33 04 47 53
www.kongsberg.com
subsea@kongsberg.com



KONGSBERG