

## Antenna Approval

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Telenor Satellite (TS) hereby approves the antenna mentioned below with the restrictions listed for the use on the TS space segment. The restrictions are based on that the antenna must be compliant with “*VSAT Type Approval Procedures for Earth Station on Vessels (ESVs) accessing Telenor Space Segment*”.

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<b>Antenna manufacturer:</b>	<u>Thrane</u> & Thrane A/S trading as Cobham SATCOM Lundtoftegaardsvej 93D, KD-2800 Kgs. Lyngby, DENMARK Tel: +45 39 55 88 00, Fax: +45 39 55 88 88, <a href="mailto:info@thrane.com">info@thrane.com</a>
<b>Antenna Model:</b>	SAILOR 600 VSAT Ku
<b>Antenna:</b>	65 cm, Stabilized maritime Ku-band antenna, 3 axis
<b>Transmit Gain:</b>	37.4 dBi at 14.5 GHz
<b>XPD:</b>	> 35 dB on axis
<b>Polarization:</b>	Linear
<b>Transmit Frequency:</b>	13.75 – 14.5 GHz
<b>Receive Frequency:</b>	10.7 – 12.75 GHz
<b>Maximum allowed EIRP:</b>	36.8 dBW/40 kHz

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### Stabilized platform movements and pointing accuracy

The manufacturer confirms that the Sailor 600 Ku Maritime VSAT Antenna, when being operated within the specified ship motion limits, is able to maintain RMS pointing accuracy towards the satellite to within  $\pm 0.2^\circ$ . The specified ship motion limits are:

Roll= $30^\circ$  in a period of 6 sec

Pitch= $15^\circ$  in a period of 5 sec

Yaw= $10^\circ$  in a period of 8 sec

If the ship motion in terms of vibration and shock should exceed the specified limits, an additional safety mechanism is built in to protect neighboring satellite systems and will, via control signals to the BUC, disable signal transmission if the pointing error towards the satellite exceeds  $\pm 0.5^\circ$ .

### Antenna testing and reproduction

The antenna approval is based on test data provided by the manufacturer, obtained during CATR measurements at the Thales Alenia Space facility in Cannes, France.

The manufacturer is responsible for quality reproduction in the factory. Any major changes in the construction of the antenna or RF system are subject to revision, and will be considered on case-by-case basis.

### Environmental standards

The antenna complies with, inter alia, the following environmental standards including EMI/EMC/ERM: EN 60945, EN 60950, R&TTE Directives 1999/5/EC (essential requirements), ETSI EN 301 489-12; V1.2.1 (2003-05).

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