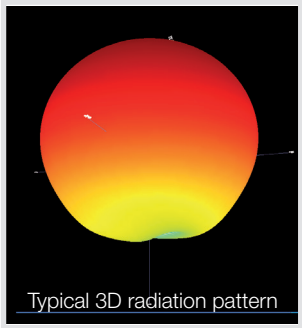
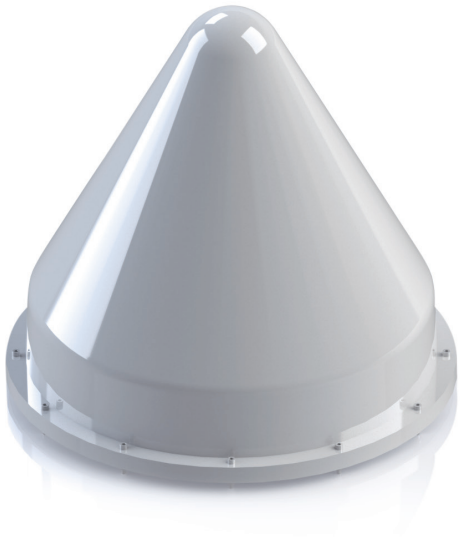
GALILEO/GPS
Base Station Reference Antennas





This antenna has been designed under an ESA (European Space Agency) contract specifically targeting fixed ground segment reference applications requiring very strong constraints on phase center stability and multi-path immunity.

POSITIONING ANTENNAS

SOLUTION FOR

- **Reference applications covering GALILEO E5, E6, L1 bands and GPS L5, L2, L1 bands**

Main features

Technical performance

- Excellent phase center and group delay stability
- Highly stable radiation pattern (magnitude & phase)
- Optimized radiating element combined with a choke ring provides increased multi-path immunity
- Wide bandwidth of the radiating helix
- Reduced ohmic losses (< 1.0 dB)

Design

- Sealed radome resists extreme weather conditions
- High-performance LNA connector
- Reduced accommodation (easy to install at the top of a mast)
- Integrated thermo-regulation for polar applications (down to -60° C)
- Dedicated filters for out-of-band rejection and dedicated LNA for pre-amplification

Delivered documents

- Measured return loss
- Measured radiation pattern
- Phase center calibration report

Related standards

- IEC 60068-2/14; -2/6; -2/64; -2/32
- EN 55022

Product configuration

Equipment

■ Specific radome

Related services

□ Maintenance
□ Dedicated filters for custom GALILEO, GPS and/or GLONASS sub-bands
□ Mechanical support

■ Included □ Optional

ENVIRONMENTAL TESTING

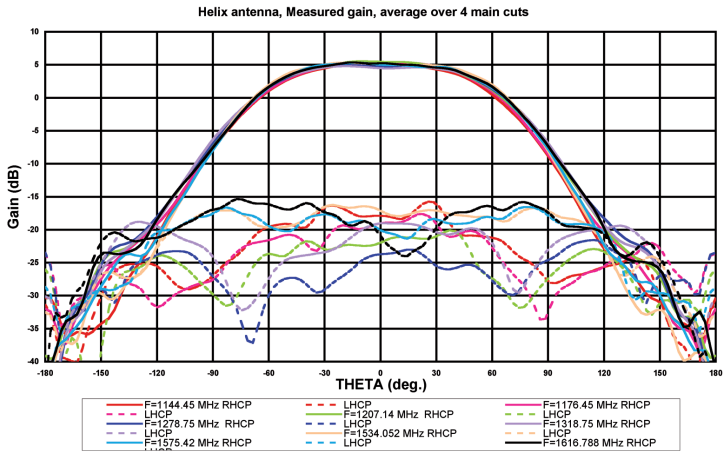
- Thermal cycling test performed according to the norm IEC 60068-2-14.
- Sine vibration test performed according to the norm IEC 60068-2-6.
- Random vibration test performed according to the norm IEC 60068-2-64.
- Free fall test performed according to the norm IEC 60068-2-32.

Electrical characteristics

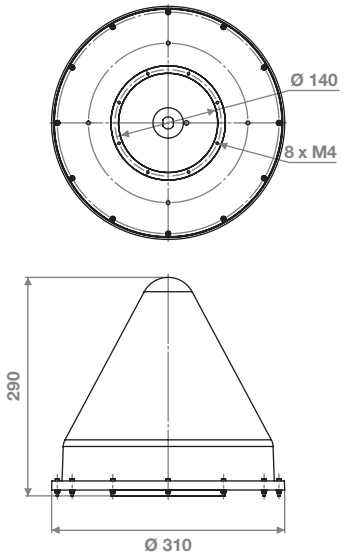
Part number	**ANTE010-A**
Operational frequency bands	B1 Galileo/GPS: 1575.42 ± 20.46 MHz (GPS L1 C/A, GPS L1 P(Y), GAL L1F, SBAS L1) B2 Galileo/GPS/GLONASS: 1227.60 ± 61.38 MHz (GPS L5, GPS L2C, GPS L2 P(Y), GAL E5a, GAL E5b, SBAS L5, GLO L2 C/A, GLO L2 P, GAL E6C) Option: reduced B1 and/or B2 bands
Polarization*	Right hand circularly polarized
Coverage*	Maximized within a conical coverage up to 85° from zenith
Gain antenna (without LNA)*	> +5 dBic at zenith > 0 dBic from 25 to 90° elevation < -7 dBic at 5° elevation
LNA gain*	35 dB +/- 2 dB
Axial ratio*	< 7 dB at 5° elevation < 5 dB at 10° elevation < 3 dB at 30° elevation < 2 dB at 60° elevation
Phase center knowledge accuracy*	Within 5 mm radius
Phase center stability	< 1 mm radius for B1 sub-band < 0.5 mm radius for B2 sub-band
Group delay variation*	< 10 nsec
Group delay stability*	< ± 250 ps at a given frequency point over temperature
Signal to noise density ratio*	C/No ≥ 35 dBHz at B2 or B1 reference conditions
LNA 1 dB compression point*	≥ -10 dBm
LNA output 3rd order intercept*	≥ 0 dBm
LNA burn-out protection (CW)*	Antenna system able to withstand, with no damage, an in-band +20 dBm CW signal
LNA burn-out protection (In-band pulse)*	Antenna system able to withstand, with no damage, an in-band pulsed interference with the following characteristics: • Pulse peak power: +30 dBm • Pulse max width: 1ms (max duty cycle of 10%)

(*) Applicable to each of the GALILEO E5, E6, L1 bands, GPS L5, L2, L1 bands and GLONASS L2, L1 bands.

Typical measured gain (without LNA)



Dimensional drawing



Functional & environmental characteristics

Part number	ANTE010-A
Antenna input impedance	50 Ohms
Supply voltage	5 V (supplied through the RF cables)
Power consumption	≤ 0.3 Watt (total power consumption)
Output VSWR	< 1.7
Emitted radiation	The antenna system radiated emission is compatible with [EN 55022] recommendations
Conducted EMC	The antenna system conducted emission is compatible with [EN 55022] recommendations
Temperature range	Tested to IEC 60068-2-14 edition 1986 test Nb for thermal cycling Operation range: -40° C to +80° C (option with heaters for polar operation -60° C to + 80° C) Storage range: -60° C to +85° C
Wind/other	Able to withstand wind and blast conditions < 200 km/h
Housing	Hermetic to rain under storm conditions
Pressure	The antenna system works properly with an equivalent air pressure condition of 6000 m altitude
Radiation	Able to withstand UV and other radiation
Radome protection	Radome composed of epoxy resin (60%) and glass fibers (40%) with a polyurethane coating
Shock and vibration	Tested to IEC 60086-2-6 (Sinusoidal vibration) Tested to IEC 60086-2-64 edition 1993 (random vibrations) Tested to IEC 60086-2-32 edition 1975 (free fall)

Mechanical characteristics

Part number	ANTE010-A
Dimensions (diameter x height)	310 Ø mm x 290 mm
Weight (approx)	< 3.5 Kg
Connector	N Female single connector, feeding through RF cable (+5 V)
Radome coating	Polyurethane
Color	White
Ingress protection	Alodine 1200 according to MIL-C 5541 E class 3 for coating treatment
Operating temperature	-40° C to +80° C (option with heaters: -60° C to +80° C)