Amphenol ANTENNA SOLUTIONS

# 45-Port Antenna

698-960 | 1695-2690 | 1695-2690 | 3300-3800 MHz

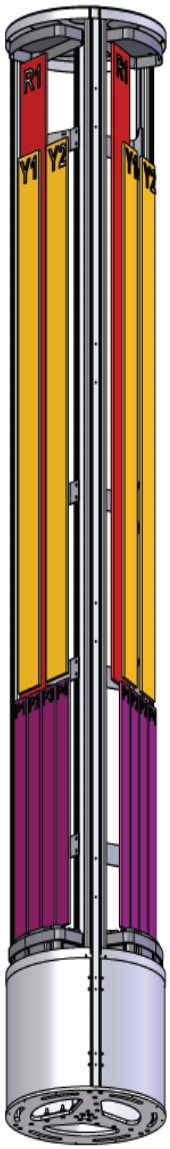
5G Ready | 65°/85° | 2325 mm

## 6878335-3

6878335G-3

Quad Band, 45-Port, 65°/85°, XPOL, Tri-Sector Antenna, Variable Tilt, 2325 mm

- Quad band antenna, dual polarization, 45 connectors
- Independent tilt on each band 2-12° / 2-12° / 2-12° / 2-12°
- MET and RET versions, 3GPP/AISG2.0, in multiple single RET (multiple device type1) or in Multi-RET (device type 17, with firmware above MD3.10).
- Our patented, RET module controlling all tilt angles, fully inserted inside the antenna (field replaceable).
- 5G optimal deployment with integrated 8T8R 3.5 GHz arrays.
- Tri-sector solution in one enclosure, fixed azimuth.




| PRODUCT OVERVIEW | | | | | |
|---|---|---|---|---|---|
| | Frequency Range (MHz) | 698-960 | 1695-2690 | 1695-2690 | 3300-3800 |
| | Array | R1 | Y1 | Y2 | P1 |
| | Connector | 1-2 | 3-4 | 5-6 | 7-15 |
| | Polarization | XPOL | XPOL | XPOL | XPOL |
| | Azimuth Beamwidth (avg) | 65° | 65° | 65° | 85° |
| | Electrical Downtilt | 2-12° | 2-12° | 2-12° | 2-12° |
| | Dimensions | 2325 x Ø573 mm | | | |

**ORDERING OPTIONS** Select from the different options listed below

| SELECT ELECTRICAL DOWNTILT CONTROL & AISG PROTOCOL | SELECT ACTUATOR | SELECT CONNECTOR TYPE | | ANTENNA MODEL NUMBER |
|---|---|---|---|---|
| Manual Electrical Tilt (MET) | --- | 6 x 4.3-10 Female<br>1 x MQ4 & 1 x MQ5 | Three Sectors | 6878335-3 |
| | | | Two Sectors | 6878335-2 |
| | | | One Sector | 6878335-1 |
| Remote Electrical Tilt (RET)<br>AISG v2.0 / 3GPP | Multi-Device Control Unit (MDCU) | 6 x 4.3-10 Female<br>1 x MQ4 & 1 x MQ5 | Three Sectors | 6878335G-3 |
| | | | Two Sectors | 6878335G-2 |
| | | | One Sector | 6878335G-1 |

# 6878335-3

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## ELECTRICAL SPECIFICATIONS Ultra Low Band — R1

| | | | | | | |
|---|---|---|---|---|---|---|
| Frequency Range | | MHz | 698-960 | | | |
| | | MHz | 698-806 | 790-862 | 824-894 | 880-960 |
| Polarization | | --- | ±45° | | | |
| Gain | Over all Tilts | dBi | 14.2 ± 0.4 | 14.5 ± 0.4 | 14.7 ± 0.6 | 15.0 ± 0.5 |
| Azimuth Beamwidth | | degrees | 72.4° ± 1.6° | 71.9° ± 2.7° | 71.7° ± 3.1° | 72.3° ± 3.5° |
| Elevation Beamwidth | | degrees | 12.1° ± 1.1° | 10.5° ± 0.7° | 10.3° ± 0.7° | 9.6° ± 0.6° |
| Electrical Downtilt | | degrees | 2°-12° | | | |
| Impedance | | Ohms | 50 | | | |
| VSWR (Return Loss) | | --- (dB) | < 1.5 (>14) | | | |
| Passive Intermodulation 3rd Order for 2 x 20W Carriers | | dBc | < -150 | | | |
| Front-to-Back Ratio, Total Power, ±30° | | dB | > 25.5 | > 25.4 | > 26.0 | > 24.0 |
| Upper Sidelobe Suppression, Peak to 20° | | dB | > 19.3 | > 17.2 | > 17.2 | > 20.4 |
| Cross Polar Discrimination (XPD) Sector Edges (±60°) | | dB | > 9.5 | > 9.8 | > 9.8 | > 6.2 |
| Maximum Effective Power Per Port | | Watts | 250 | | | |
| Inter/Intra Cluster Isolation | | dB | > 25 | | | |

*All parameters are compliant with BASTA revision V12.0*

## ELECTRICAL SPECIFICATIONS Ultra Wide Band — Y1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency Range | | MHz | 1695-2690 | | | | |
| | | MHz | 1695-1880 | 1850-1990 | 1920-2180 | 2300-2500 | 2490-2690 |
| Polarization | | --- | ±45° | | | | |
| Gain | Over all Tilts | dBi | 15.9 ± 0.3 | 16.2 ± 0.5 | 16.5 ± 0.4 | 17.0 ± 0.3 | 17.5 ± 0.4 |
| Azimuth Beamwidth | | degrees | 72.5° ± 2.3° | 71.8° ± 2.4° | 69.1° ± 3.7° | 68.2° ± 2.4° | 64.0° ± 3.4° |
| Elevation Beamwidth | | degrees | 9.9° ± 0.6° | 9.3° ± 0.5° | 8.8° ± 0.7° | 7.4° ± 0.3° | 6.8° ± 0.4° |
| Electrical Downtilt | | degrees | 2°-12° | | | | |
| Impedance | | Ohms | 50 | | | | |
| VSWR (Return Loss) | | --- (dB) | < 1.5 (>14) | | | | |
| Passive Intermodulation 3rd Order for 2 x 20W Carriers | | dBc | < -153 | | | | |
| Front-to-Back Ratio, Total Power, ±30° | | dB | > 27.0 | > 26.4 | > 26.5 | > 25.2 | > 29.0 |
| Upper Sidelobe Suppression, Peak to 20° | | dB | > 19.6 | > 17.3 | > 18.2 | > 21.2 | > 17.6 |
| Cross Polar Discrimination (XPD) Sector Edges (±60°) | | dB | > 11.8 | > 9.7 | > 8.9 | > 10.0 | > 10.0 |
| Maximum Effective Power Per Port | | Watts | 200 | | | | |
| Inter/Intra Cluster Isolation | | dB | > 25 | | | | |

*All parameters are compliant with BASTA revision V12.0*

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## ELECTRICAL SPECIFICATIONS Ultra Wide Band

**Y2**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency Range | | MHz | 1695-2690 | | | | |
| | | MHz | 1695-1880 | 1850-1990 | 1920-2180 | 2300-2500 | 2490-2690 |
| Polarization | | --- | ±45° | | | | |
| Gain | Over all Tilts | dBi | 15.9 ± 0.4 | 16.2 ± 0.6 | 16.6 ± 0.6 | 16.9 ± 0.1 | 17.5 ± 0.3 |
| Azimuth Beamwidth | | degrees | 72.4° ± 2.9° | 71.9° ± 2.7° | 69.3° ± 4.1° | 69.4° ± 2.9° | 63.4° ± 3.6° |
| Elevation Beamwidth | | degrees | 9.9° ± 0.7° | 9.3° ± 0.5° | 8.8° ± 0.6° | 7.5° ± 0.4° | 6.9° ± 0.4° |
| Electrical Downtilt | | degrees | 2°-12° | | | | |
| Impedance | | Ohms | 50 | | | | |
| VSWR (Return Loss) | | --- (dB) | < 1.5 (>14) | | | | |
| Passive Intermodulation 3rd Order for 2 x 20W Carriers | | dBc | < -153 | | | | |
| Front-to-Back Ratio, Total Power, ±30° | | dB | > 25.9 | > 26.6 | > 26.8 | > 26.0 | > 29.7 |
| Upper Sidelobe Suppression, Peak to 20° | | dB | > 18.1 | > 16.4 | > 17.2 | > 19.9 | > 17.1 |
| Cross Polar Discrimination (XPD) Sector Edges (±60°) | | dB | > 12.4 | > 10.5 | > 9.2 | > 12.5 | > 9.4 |
| Maximum Effective Power Per Port | | Watts | 200 | | | | |
| Inter/Intra Cluster Isolation | | dB | > 25 | | | | |

*All parameters are compliant with BASTA revision V12.0*

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Quad Band, 45-Port, 65°/85°, XPOL, Tri-Sector Antenna, Variable Tilt, 2325 mm

| ELECTRICAL SPECIFICATIONS | | P1 |
|---|---|---|
| Frequency Range | | 3300-3800 MHz |
| Impedance | | 50Ω |
| VSWR | | < 1.5 |
| Polarisation | | ±45° |
| Return loss | | > 14 dB |
| Electrical Downtilt Range | | 2-12° |
| Single Column Width | Gain Over all Tilts | 15.3 ± 1 dBi |
| | Azimuth Beamwidth | 83.5° ± 10° |
| | Elevation Beamwidth | 5.5° ± 0.5° |
| | Cross-Polar Discrimination (XPD) 0° | ≥ 15 dB |
| | Upper Sidelobe Suppression, Peak to 20° | ≥ 11.8 dB |
| | Front-to-Back Ratio, Total Power, ±30° | ≥ 25.9 dB |
| 65° Broadcast Beam | Gain Over all Tilts | 16.3 ± 0.9 dBi |
| | Azimuth Beamwidth | 65.5° ± 5° |
| | Elevation Beamwidth | 5.5° ± 0.5° |
| | Cross-Polar Discrimination (XPD) 0° | ≥ 15 dB |
| | Upper Sidelobe Suppression, Peak to 20° | ≥ 14 dB |
| | Front-to-Back Ratio, Total Power, ±30° | ≥ 27 dB |
| 0° Direct Service Beam | Gain Over all Tilts | 20.5 ± 0.7 dBi |
| | Azimuth Beamwidth | < 26° |
| | Cross-Polar Discrimination (XPD) 0° | ≥ 15 dB |
| | Front-to-Back Ratio, Total Power, ±30° | ≥ 28 dB |
| ±30° Direct Service Beam | Gain | 18.4 ± 0.7 dBi |
| | Horizontal Beamwidth (3dB) | < 27.4° |

*Standard values based on NGMN-P-BASTA version 12.0 recommendation.*

## Beamforming Characteristics

| | | |
|---|---|---|
| Calibration and Electrical Parameter | Coupling Factor Between Calibration and Each Antenna Port | -26 ± 2 dB |
| | Maximum Amplitude Tolerance from Calibration Port to Input Ports | ≤ 0.7 dB |
| | Maximum Phase Tolerance from Calibration Port to Input Ports | ≤ 9 dB |
| | Average Power Per Port | 25 W |
| Inter/Intra Cluster Isolation | | ≥ 25 dB |
| Grounding | | DC Ground |
| Spacing between columns | | 44 mm |

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## ELECTRICAL DOWNTILT CONTROL

For multiband antennas, electrical downtilt for each band can be controlled separately.

| | |
|---|---|
| Manual Electrical Tilt (MET) Control | A colored knob at the end of the tilt indicator allows change of the tilt without need of a tool. The knob color is identical to the corresponding connector color. The manual tilt 'override' function is always available with no need to remove the physical RET motor. |
| Remote Electrical Tilt (RET) Control | The remote control of the electrical tilt is managed by a Multi-Device Control Unit (MDCU) or a Multi-Device Dual Unit (MDDU) inserted in the bottom of the antenna. *See details below and refer to the ordering options to see which actuators are available with this particular antenna.* A single actuator individually controls the tilt of each band (no need for daisy chain cables between the bands). This module does not add any additional length to the antenna. |

## RET ACTUATOR

Amphenol's **RET-READY** antennas are delivered with the RET Actuator already installed and pre-commissioned with all antenna parameters. Every RET device is factory configured and calibrated so the antenna is ready to be used once delivered to the site which means that there is no need for further installation of RET devices or for programming their configuration or for running a calibration process.

| | |
|---|---|
| RET-READY ACTUATORS | **Multi-Device Control Unit (MDCU)**. The MDCU is an electronic module that allows the remote control of the electrical downtilt (RET) in Amphenol antennas with factory embedded motors. The MDCU is factory installed. *Refer to the* ORDERING OPTIONS *for availability with this model.* |
| | **Multi-Device Dual Unit (MDDU)**. The MDDU allows two separate RET Controllers to independently drive the RETs in antennas with factory embedded motors (for antenna sharing or two technologies). The MDDU is factory installed. *Refer to the* ORDERING OPTIONS *for availability with this model.* |

| | | |
|---|---|---|
| Number of RET-READY Actuators | | One per antenna |
| Input Voltage | | +10 to +30 V |
| Power Consumption | Idle State (AISG P1) | 0.5 W |
| | High Power Mode (AISG P2) | 3 W |
| Protocol | | 3GPP/AISG 2.0 |
| Tilt Change Duration | | Less than 15 seconds, typical (may vary dependent on antenna type and outdoor temperature) |
| Precision | | ±0.5° |
| Tilt Change Capability | | 50,000 minimum |
| RET Interface | MDCU | One pair of AISG Male and Female (type IEC60130-9) |
| | MDDU | Two male AISG 8 pin connectors (type IEC60130-9 Ed 3.0) |
| Field Replaceable Unit | | Yes |

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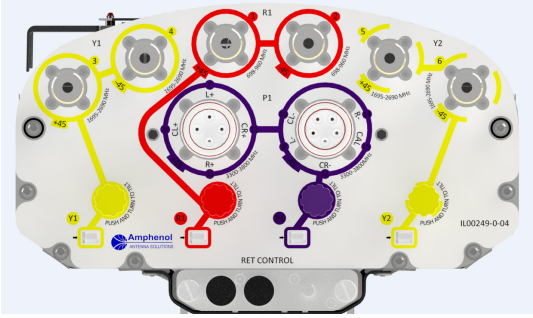


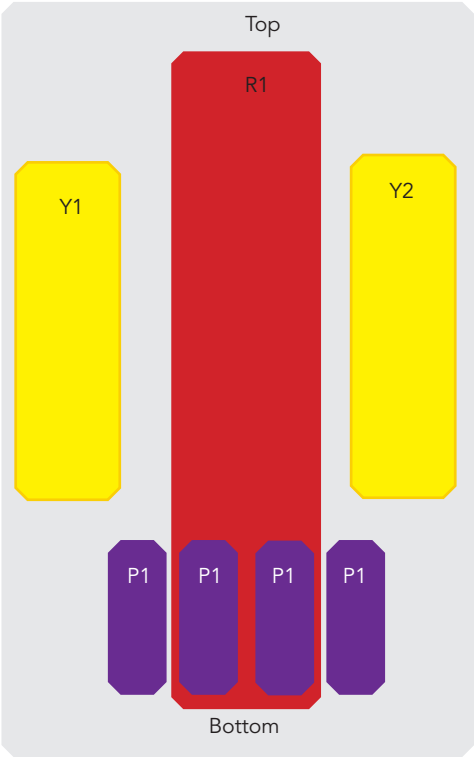


| ARRAY LAYOUT | ARRAY | FREQUENCY | CONNECTOR | CONNECTOR TYPE |
|---|---|---|---|---|
| | R1 | 698-960 | 1-2 | 4.3-10 Female |
| | Y1 | 1695-2690 | 3-4 | 4.3-10 Female |
| | Y2 | 1695-2690 | 5-6 | 4.3-10 Female |
| | P1 | 3300-3800 | 7-15 | 1 x MQ4 & 1 x MQ5 |

*Diagram shown at right depicts the view from the front of the antenna. The illustration is not shown to scale.*

## MECHANICAL SPECIFICATIONS

| | | | |
|---|---|---|---|
| Length | | mm (in) | 2325 (91.5) |
| Diameter | | mm (in) | 573 (22.6) |
| Net Weight | Three Sectors | kg (lbs) | 183 (403.5) |
| | Two Sectors | kg (lbs) | 160 (352.7) |
| | One Sector | kg (lbs) | 137 (302.0) |
| Windload (EN 1991-1-4:2005 using Wind Tunnel Coefficients) | Calculation | km/h (mph) | 160 (99.4) |
| | Frontal | N (lbf) | 790 (177.6) |
| Operational Wind Speed | | km/h (mph) | 160 (99.4) |
| Survival Wind Speed | | km/h (mph) | 200 (124) |
| Radome Color | | --- | Gray RAL7035 |
| Radome Material | | --- | Outdoor Plastic |
| Lightning Protection | | --- | Direct Ground |
| Shipping | Shipping Dimensions (Length x Width x Depth) | mm (in) | 2550 x 760 x 820 (100.4 x 29.9 x 32.3) |
| | Shipping Weight | kg (lbs) | 339 (747.4) |
| | Shipping Volume | $m^3$ ($ft^3$) | 1.59 (56.2) |

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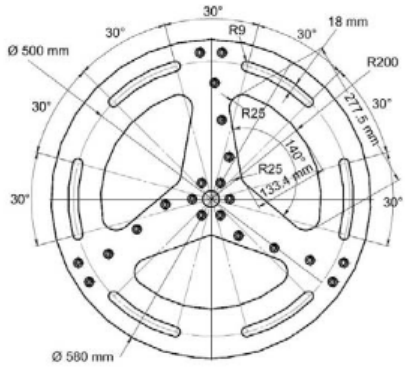
## ENVIRONMENTAL SPECIFICATIONS

| | | |
|---|---|---|
| Environmental Standard | --- | ETS 300 019 |
| Operating Temperature | ° C (° F) | -40° to +60° (-40° to 140°) |
| Product Environmental Compliance | --- | Product is RoHs Compliant |

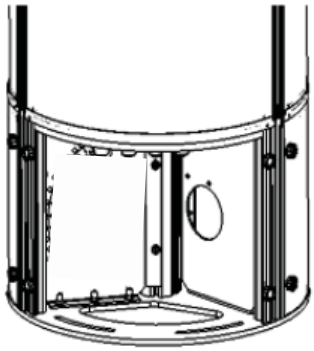
## INSTALLATION Please read all installation notes before installing this product.

| | |
|---|---|
|  | Always attach the antenna by all mounting points. |
| | Do not install the antenna with the connectors facing upwards. |

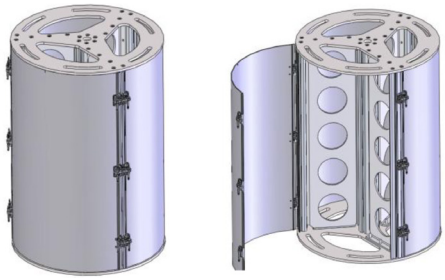
Mounting Flange Interface

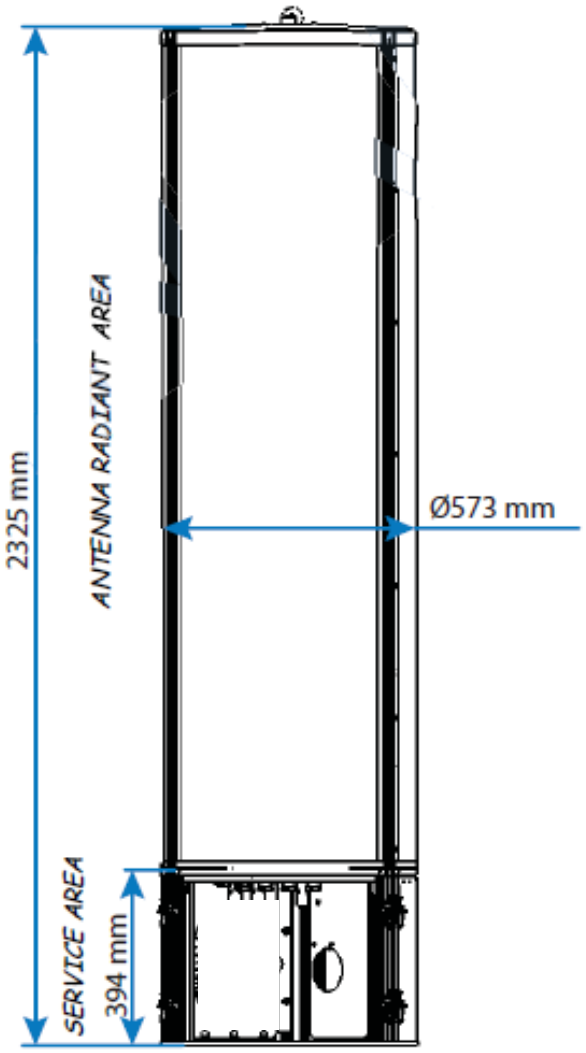



Service Area (Opened Shroud)



**Trio Extension (optional)**






Quoted performance parameters are provided to offer typical, peak or range values only and may vary as a result of normal testing, manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to products may be made without notice.