



# AIRSPPEED 2900 INSTALLATION GUIDE

5G-NR Outdoor gNB

Installation Guide

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## Document Information

This document details procedures for installing the Airspan’s AirSpeed 2900 gNB 5G-NR Outdoor unit. AirSpeed 2900 is a compact, easy to deploy gNB, for pole and wall installation.

This document is intended for qualified personnel with a working knowledge of 5G.

## Revision History

Revision	Date	Summary of Changes	Created by
Rev 0.1 - 0.4	November 2021	<ul style="list-style-type: none"><li>Initial document – draft</li><li>After comments - draft</li></ul>	CY/MSF
Rev A – A1	November 2021	Published – minor changes	CY/MSF
Rev A2 – A3	December 2021	<ul style="list-style-type: none"><li>Table 1- Changed TX power to 2W</li><li>4.4 Added - Octis Latch closing caution</li></ul>	CY/MSF
Rev A4	February 2022	<ul style="list-style-type: none"><li>Lift Caution - Added lifting caution</li></ul>	CY/MSF
Rev A5	February 2022	<ul style="list-style-type: none"><li>Modifications from comments</li></ul>	CY/MSF
Rev A6	March 2022	<ul style="list-style-type: none"><li>Added Optical Fiber Cable – Diameter</li><li>Table 8 – Status LED Display</li><li>Table 9 – BH LED Display</li></ul>	CY/MSF
Rev A7	May 2022	<ul style="list-style-type: none"><li>Updated - Table 1</li></ul>	MSF

## Warnings and Cautions

### Human Exposure to Radio Frequencies

The AirSpeed 2900 gNB 5G unit should be operated from a minimum safe distance of 90 cm (35.4 in.)

### Radio Interference

The AirSpeed 2900 generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment on and off, the technician is encouraged to try to correct the interference by performing one or more of the following measures:

- Re-orientate or relocate the unit
- Increase separation between the units and/or End Devices
- Connect the equipment to a circuit different from that to which the power source is connected

### Modifications

Any changes and modifications to this device that are not expressly approved by Airspan Networks may void the user's authority to operate the equipment.

## General

- Only qualified personnel should be allowed to install, replace, and service the equipment.
- The device cannot be sold retail, to the general public or by mail order. It must be sold to operators.
- Installation must be controlled.
- Installation must be performed by licensed professionals.
- Installation requires special training. The AirSpeed 2900 should be installed ONLY by experienced installation professionals who are familiar with local building and safety codes and, wherever applicable, are licensed by the appropriate government regulatory authorities. Failure to do so may void Airspan's product warranty and may expose the end user or the service provider to legal and financial liabilities. Airspan and its resellers or distributors are not liable for injury, damage or violation of regulations associated with the installation of outdoor units or antennas.
- The device is to be installed in a Restricted Access Location.
- Surge Arrestors and Transient Voltage Surge Suppressors installed external to the ITE are required to comply with the appropriate CEC/NEC requirements.
- Equipment connected to the PoE port must have its own fire enclosure.

## Important Safety Instructions

- Read and Save these instructions
- This Installation Guide contains instructions and warnings that should be followed during installation, and operation.
- Failure to follow these instructions could cause bodily injury and/or product failure



## Safety

1. Read this guide and follow all operating and safety instructions.
2. Supply cord is not shipped with the unit and is to be provided by user. Installation is to be performed by a qualified electrician according to local codes. Installation to be done in accordance with the National Electrical Code (NEC), ANSI/NFPA 70, the Canadian Electrical Code (CEC), Part I, CAN/CSA C22.1, and when applicable, the National Electrical Safety Code, IEEE C2.
3. Static sensitive components inside - do not remove the lid or base: No user serviceable parts inside.
4. The ground connection should be made before connecting to supply connections.
5. Position the power cord to avoid possible damage; do not overload circuits.
6. Do not place this product on or near a direct heat source, and avoid placing objects on the terminal.
7. To avoid electrical shock do not install this device during adverse conditions such as rain or inclement weather.
8. Use only a damp cloth for cleaning. Do not use liquid or aerosol cleaners. Disconnect the power before cleaning.
9. The units should not be located too near power lines or other electrical power circuits, where it can come into contact with such power lines or circuits.
10. The radio transceiver must be properly grounded to protect against power surges and accumulated static electricity. It is the user's responsibility to install this device in accordance with the local electrical codes.
11. Installation of the AirSpeed 2900 gNB must be contracted to a professional installer.
12. The circuit breaker should be easily accessible in case you have to disconnect the device.
13. When installed in the final configuration, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.

## Warning of Hazardous Voltages

On AC installations, hazardous voltages exist. Use caution when verifying or working with AC power. Remove metal jewelry that could come into contact with AC power.

On DC sections, short-circuiting the low voltage, low impedance circuits can cause severe arcing that may result in burns or eye damage. Remove rings, watches etc. to avoid shorting DC circuits.



Airspan products do not contain hazardous substances (as defined in UK Control of Substances Hazardous to Health Regulations 1989 and the Dangerous Substances Regulations 1990). At the end of any Airspan products life cycle, the customer should consult with Airspan to ensure that the product is disposed of in conformance with the relevant regulatory requirements.

## Adherence to European Directive 2014/53/EU

European Council Recommendation 2014/53/EU details basic restrictions and reference levels on human exposure to electromagnetic fields as advised by the ICNIRP. Adherence to these recommended restrictions and reference levels should provide a high level of protection as regards the established health effects that may result from exposure to electromagnetic fields.

## Warning Symbols

The following symbols may be encountered during installation or troubleshooting. These warning symbols mean danger. Bodily injury may result if you are not aware of the safety hazards involved in working with electrical equipment and radio transmitters. Familiarize yourself with standard safety practices before continuing.



## Service Information

Refer all repairs to qualified service personnel. Do not modify any part of this device, as this will void the warranty.

Disconnect the power to this product and return it for service if the following conditions apply:

1. The terminal does not function after following the operating instructions outlined in this manual.
2. The product has been dropped or the housing is damaged.

Locate the serial number of the terminal and record this on your registration card for future reference. Also record the MAC address, located on the product sticker.

## UL Information

- The equipment must be properly grounded according with NEC and other local safety code requirements.
- Reminder to all the BWA system installers: Attention to Section 820-40 of the NEC which provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as is practical.
- AirSpeed 2900 gNB is designed to operate in environmental conditions complying with IP65 and relevant standards.

## Lightning Protection



**WARNING: The following notes are general recommendations for the system.**

The wireless equipment should be installed by a qualified professional installer and must follow local and national codes for electrical grounding and safety. Failure to meet safety requirements and/or use of non-standard practices and procedures could result in personal injury and damage to equipment. A direct lightning strike may cause serious damage even if these guidelines are followed.

All outdoor wireless equipment is susceptible to lightning damage from a direct hit or induced current from a near strike. Lightning protection and grounding practices in local and national electrical codes

serve to minimize equipment damage, service outages, and serious injury. Reasons for lightning damage are summarized as:

- Poorly grounded tower/antenna sites that can conduct high lightning strike energy into equipment.
- Lack of properly installed lightning protection equipment that can cause equipment failures from lightning induced currents.

A lightning protection system provides a means by which the energy may enter earth without passing through and damaging parts of a structure. A lightning protection system does not prevent lightning from striking; it provides a means for controlling it and preventing damage by providing a low resistance path for the discharge of energy to travel safely to ground. Improperly grounded connections are also a source of noise that can cause sensitive equipment to malfunction.

A good tower grounding system disperses most of the surge energy from a tower strike away from the building and equipment.

To limit the equipment damage due to a lightning strike, the following practices are recommended for the wireless system:

- Provide direct grounding from the antenna mounting bracket, the radio and antenna and the lightning/surge protectors to the same ground point at the base of the tower or a ground bus on the building. Use the grounding screws on the antenna bracket and the radio and antenna for terminating the ground wires.
- The AC wall outlet ground must be connected to the same grounding system as the eNodeB.

## Outdoor Ethernet Cabling

- Ethernet cable connected to should be outdoor grade with UV protection.
- Use shielded out CAT5e (minimum) cabled terminated with metallic RJ45 connectors.
- In order to protect any indoor units, install surge protection circuits on all copper cables on their entrance to the building.
- Surge protection circuit must use a minimum 16AWG grounding cable.

## DECLARATION OF CONFORMITY

Declaration of Conformity with Regard to the R&TTE Directive 2014/53/EU

### **Czech:**

Airspan tímto prohlašuje, že tento přístroj je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 2014/53 / EU.

### **Danish:**

Undertegnede, Airspan erklærer hermed, at følgende udstyrsenhed opfylder de væsentlige krav og andre relevante krav i direktiv 2014/53 / EF.

### **Deutsch:**

Hiermit erklärt Airspan, dass die Produkteinheit die grundlegenden Anforderungen und anderen relevanten Bestimmungen der Richtlinie 2014/53 / EU erfüllt.

**Estonian:**

Käesolevaga kinnitab Airspan, et seadme seade vastab direktiivi 2014/53 / EL oluliste nõuetele ja muudele kõnealuse direktiivi asjakohastele sätetele.

**English:**

This equipment is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU.

**Español:**

Por medio de este Airspan, declara que la unidad cumple con los requisitos esenciales y cualquier otra disposición aplicable o exigible de la Directiva 2014/53 / UE.

**Greek:**

ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ ΠΡΟΔΙΑΓΡΑΦΗ, η Airspan ΔΗΛΩΝΕΤΑΙ ότι η μονάδα συμμορφώνεται με τις ουσιώδεις απαιτήσεις και τις λοιπές σχετικές διατάξεις της οδηγίας 2014/53 / ΕΕ.

**Français:**

Airspan déclare par la présente que l'appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 2014/53 / UE.

**Italiano:**

Con la presente Airspan dichiara che questa unità è conforme ai requisiti essenziali e alle altre disposizioni pertinenti stabilite dalla direttiva 2014/53 / UE.

**Latvian:**

Ar šo Airspan paziņo, ka vienība atbilst Direktīvas 2014/53 / ES būtiskajām prasībām un citiem attiecīgajiem noteikumiem;

**Lithuanian:**

Šis „Airspan“ pareiškia, kad šis įrenginys atitinka esminius Direktyvos 2014/53 / ES reikalavimus ir kitas nuostatas.

**Nederlands:**

Airspan verklaart hierbij dat de apparaateenheid voldoet aan de essentiële vereisten en andere relevante bepalingen van richtlijn 2014/53 / EU.

**Maltese:**

Hawnhekk, Airspan, tiddikjara li din l-unità tikkonforma mar-reqwiżiti essenzjali u dispożizzjonijiet rilevanti oħra li jinsabu fid-Direttiva 2014/53 / UE.

**Hungarian:**

Alulírott, az Airspan kijelenti, hogy az egység megfelel a 2014/53 / EU irányelv vonatkozó alapvető követelményeinek és egyéb követelményeinek.

**Polish:**

Niniejszym Airspan oświadcza, że urządzenie jest zgodne z zasadniczymi wymaganiami i innymi odpowiednimi postanowieniami dyrektywy 2014/53 / UE.

**Português:**

Airspan declara que esta unidade está em conformidade com os requisitos essenciais e outras disposições da Diretiva 2014/53 / UE.

**Slovenian:**

Airspan izjavlja, da je ta enota skladna z bistvenimi zahtevami in drugimi ustreznimi določbami Direktive 2014/53 / EU.

**Slovak:**

Airspan týmto vyhlasuje, že tento prístroj spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 2014/53 / EÚ.

**Suomalainen:**

Airspan vakuuttaa täten, että laitteen tyyppi on direktiivin 2014/53 / EU olennaisten vaatimusten ja muiden asiaankuuluvien säännösten mukainen.

**Swedish:**

Därmed intygar Airspan att denna enhet överensstämmer med de väsentliga egenskapskraven och andra relevanta bestämmelser som anges i direktiv 2014/53 / EU.

**Íslenska:**

Airspan lýsir hér með yfir að þessi eining uppfylli grunnkröfur og aðrar kröfur tilskipunar 2014/53 / ESB.

**Norsk:**

Airspan erklærer herved at utstyrsenheden oppfyller grunnleggende krav og andre relevante krav i direktiv 2014/53 / EU.

**Român:**

Airspan declarâm pe propria răspundere că produsul produsului respectă cerințele esențiale și alte prevederi aplicabile din Directiva 2014/53 / UE.

The Declaration of Conformity related to this product can be obtained from [PLM@Airspan.com](mailto:PLM@Airspan.com).

## GPS Compliance

The GPS is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU."

The GPS complies with the following EMC Common Regulatory Testing standards:

- EN55022: Radiated and Conducted Emissions
- CISPR 22: Class B
- EN 50081-1: Generic Emissions Class B
- EN 50082-1: Generic Immunity Class B

- EN 61000-4-2: Electrostatic Discharge Immunity
- EN 61000-4-3: Radiated RF EM Field Immunity Test
- EN 61000-4-4: Electrical Fast Transient/Burst Test
- EN 61000-4-6: Conducted Immunity
- EN 61000-4-8: Magnetic Field Immunity



A GPS is recommended for synchronizing the unit.



An optional GPS Lightning/Surge protector is available from Airspan when installing the GPS antenna in a remote location for lightning prone deployments.

## Maximum Output TX Total Power

Table 1: AirSpeed 2900 gNB Maximum Output TX Total Power

Antenna configuration	Antenna Vendor	Antenna Model Number	Antenna Peak Gain (dB)	Signal Bandwidth (MHz)	Maximum Conducted Power (dBm)	EIRP (dBm/10MHz)	EIRP per Bandwidth (dBm)	Operational Category
1*	ALPHA	AN1003-R2	17	10.0	29.99	46.99	46.99	B
				20.0	32.23	46.63	49.23	
				30.0	33.34	45.87	50.34	
				40.0	33.00	44.23	50.00	
2	ALPHA	AW3014	18.0	10.0	28.99	46.99	46.99	B
				20.0	31.23	46.63	49.23	
				30.0	32.34	45.87	50.34	
				40.0	32.00	44.23	50.00	
3	ALPHA	AW3170	20.5	10.0	26.49	46.99	46.99	B
				20.0	28.73	46.63	49.23	
				30.0	29.84	45.87	50.34	
				40.0	29.50	44.23	50.00	



Do not set maximum output TX power to higher than local regulations.

## Voltage and Amperage

Table 2: Voltage & Amperage Draws

Power Source	Power Consumption (W)
-48D DC (-40.5V to -57V)	≈100

## Antenna System

The AirSpeed 2900 supports the following antenna options:

- Integrated antenna – front mount integrated antenna, supports two carriers, 2x 2T2R.
- External antenna – 4 ports to two external antennas. Each antenna can serve a 2T2R sector in different directions.
- Hybrid – single sector via the integrated antenna and a second sector via the external antenna.

## Integrated Antenna Parameters

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Table 3: Integrated Antenna Parameters

Polarization	Elevation BW	AZ Beamwidth	Gain
Dual Slant $\pm 45^\circ$	$8^\circ$	$65^\circ$	17dBi

## About this Document

### Purpose

This guide provides the workflow and step-by-step procedures for installing the Airspan’s AirSpeed 2900 gNB 5G Outdoor. These procedures include:

- Verify prerequisites
- Install Tilt bracket & Pole/Wall bracket
- Install the AirSpeed 2900
- Connect and manage cables





### Intended Audience

This guide is intended for persons who are responsible for installing the AirSpeed 2900 equipment.

### Document Conventions

This document uses the following typographic conventions.

Table 4: Typographic Conventions

Convention	Element
<u>Blue</u> underlined text	Cross-reference links.
<b>Bold</b> text	Keyboard buttons and GUI elements.
Command	Command names or phrases.
Computer output	Text displayed by the computer.
<u>Hyperlinks</u>	Website and e-mail addresses.
<b><u>Danger</u></b>	Signifies a hazardous situation—if not avoided—will cause death or serious injury. Describes how to avoid it.
 <b>Warning</b>	Signifies a hazardous situation—if not avoided—can cause death or serious personal injury. Describes how to avoid it.
 <b>Caution</b>	Signifies a hazardous situation—if not avoided—can void the product warranty, and cause property damage. Describes how to avoid it.
 <b>Information/Note</b>	Provides necessary information to explain a task.
 <b>Tip</b>	Provides helpful hints.



## Related Reading

The following documents contain related information:

- AirSpeed 2900 gNB 5G Product Specification
- Airspan 5G Commissioning Manual (pending)

## Customer Care Help Desk

Airspan's *Customer Care Help Desk* offers prompt and efficient customer support services.



To avail Airspan's *Customer Care Help Desk* support, you must be a registered user and must have a valid support contract. To register, click [here](#) and fill the Registration form.

To create and update issue logs, send e-mails to [Customer Care Help Desk](#). Once you submit your issue, the system generates a new issue and sends an issue number for your reference. The system uses this issue number to categorize and store e-mails under the appropriate issue.

To help *Customer Care Help Desk* identify your issue, include the issue number and your *Customer Care Helpdesk* account details in all further communications.

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## Airspan Encourages Comments

Airspan welcomes any feedback and suggestions that help to improve the quality of the documentation. Send your feedback to [documentfeedback@airspan.com](mailto:documentfeedback@airspan.com).

# 1 Getting Started

## 1.1 AirSpeed 2900 Installation Checklist

Plan the installation of the AirSpeed 2900 by using the Installation Checklist, which you can find as a removable job aid in [Appendix A](#) for this guide.

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Figure 1: AirSpeed 2900 with GPS attached



## 2 Verifying Prerequisites

Prior to installing the AirSpeed 2900 gNB 5G, verify the required safety, power, tools, parts and components. This chapter includes the hardware, software, and client requirements for installation.

### 2.1 Verifying Site Requirements

Verify where the AirSpeed unit is to be installed, access and installation method.

### 2.2 Verify Installation Requirements

#### 2.2.1 Verify the Tools

Table 5. Minimum Hardware Requirements

Tool	Use
10 mm or 13/32 inch wrench	for securing the M6x16 Hex bolts to assemble the Tilt bracket to the AirSpeed back
7/16 inch wrench	for securing Tilt bracket to the Pole bracket with the 1/4-20 bolts
1/2 inch wrench	for securing the 5/16-18 threaded rods
Large flat bladed screwdriver	for securing the pole straps (bands)








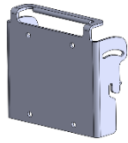
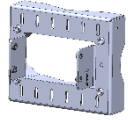



Airspan does not provide screws and wall anchors for mounting the unit to the wall. The screw size depends on the structure of the building to which the unit is to be attached. When selecting screw sizes, consideration must be given to the weight of the unit and load that may be induced in windy conditions.

## 2.2.2 Verify the Parts and Kits



Verify order and requirements to ensure the correct unit type is being installed.

Table 6. Parts & Kits

Installation Kit / Part	Product Code	Consisting of:	Images
AirSpeed 2900, 3.55-3.7 GHz (n48)	AS29-N48-DSC1	AirSpeed 2900, n48, Integrated Antenna, DC	
GPS Antenna	GPS-ANT-3	GPS Antenna with Interference Rejection	
Octis connector (-48V DC)		Connector for DC connection - included	
SFP		Connector for SFP connection	
Octis - RJ45 Ethernet Connector		Connector for Ethernet RJ45	
AirSpeed 103X Universal pole and wall mounting Kit	AS103-U-PMK-2	AirSpeed 2900 mounting kit for 50 - 250 mm (2.0 to 9.84 inch) pole including: <ul style="list-style-type: none"> <li>▪ 1 - Pole mount Bracket Base kit, including Tilt bracket and pole/wall mounting bracket</li> <li>▪ 4 - 5/16-18 threaded rod(s) +nuts, spring washer(s) &amp; Flat washers</li> <li>▪ 2- pole clinch clamps</li> <li>▪ 2- Maxi Clamps, band 9/16" wide + quick adjustment lock</li> </ul> (for poles larger than 250 mm)	    

### 2.2.3 Power Supply

AirSpeed 2900 supports direct connection to -48VDC power source:

- Operational Voltage Range: -40.5V to -57V DC

### 2.2.4 Connections

The following diagrams display the connections on the top and bottom panels of the AirSpeed 2900.



The unit requires a secure ground connection and a grounding screw fitted with a flat washer and lock washer is provided on the back and clearly marked with the universal ground symbol.

Figure 2: AirSpeed 2900 Top Ports (with integrated antenna)

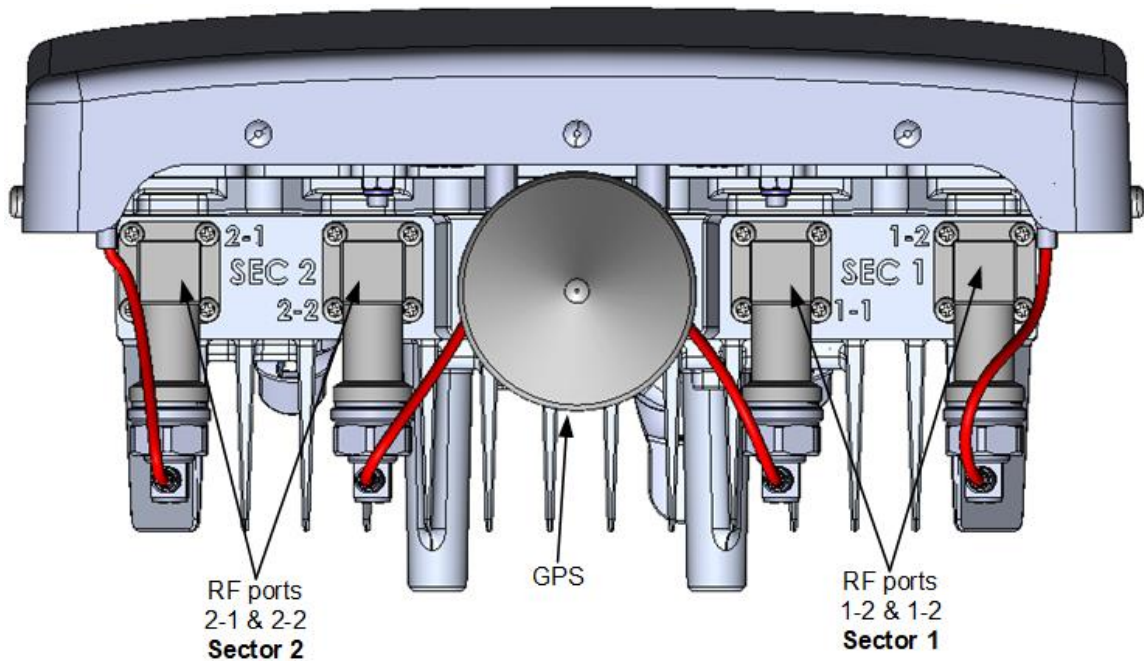
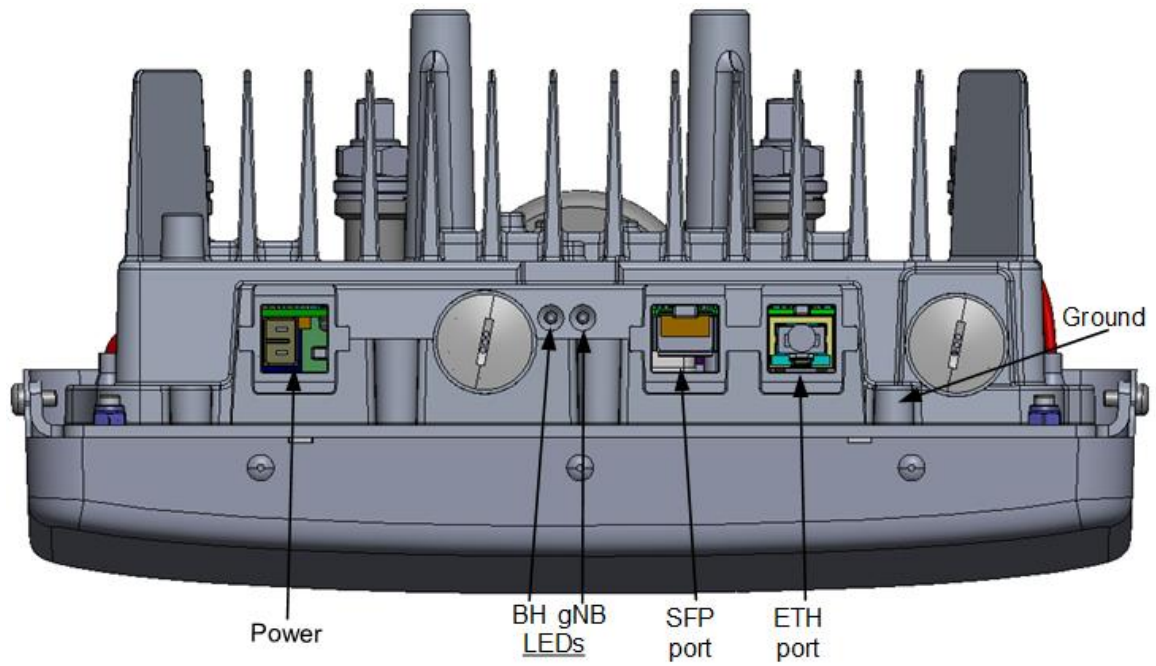


Figure 3: AirSpeed 2900 Bottom Ports



## 2.2.5 Physical Dimensions

AirSpeed 2900 is an outdoor enclosure. The Airspeed 2900 should be only be installed in a restricted area.

Table 7. AirSpeed 2900 Physical Dimensions

Variant		Dimensions (H x W x D)
AS29-N48-DSC1 – Integrated antenna		496 x 279 x 131 mm / 19.53 x 10.98 x 5.16in.
Weight	Main Unit	9 Kg / 19.84 Lbs.
	Mounting Bracket (Bracket Base)	1 Kg. / 2.2 Lbs.

## 2.2.6 Environmental

Figure 4: Environmental and Standard Compliance

Parameter	Details
IP rating	Main unit: IP67, Antenna IP65
Operating Temperature range	-40°C to +55°C (-40°F to +140°F)
Operating humidity	5% - 95%
Public transportation temperature	-40°C to 70° C / -40°F to 158°F
Public transportation humidity	Up to 95%
Ultraviolet A (UVA)/ Ultraviolet B (UVB) Rays	According to GR-2873-CORE and ASTM G154
Wind Resistance	100 mph sustained, up to 165 mph gusts
Vibration Withstand	Section 6 of Telcordia GR-3108-CORE
Safety	UL IEC62368-1:2018 (Edition No. 3)
ROHS	RoHS 3 directive
Impact	Non-metallic enclosure impact per ANSI/SCTE 10
FCC	FCC Title 47 CFR Part 96.
EMC	FCC Title 47 CFR Parts 15.107 and 15.109 Class-A

## 3 AirSpeed 2900 Installation

AirSpeed 2900 can be installed outdoors on either a pole or a wall.

The Mounting Kit - includes a Tilt bracket and pole/wall mounting bracket for fastening the unit to a pole or on a wall. Prior to installation the Tilt bracket must be assembled on the AirSpeed unit and then the mounting bracket must be affixed in place on either the pole or a wall.

### 3.1 Connecting the GPS Antenna

Prior to installation, the GPS antenna should be connected to the unit. The connection is water-proof. Additional weatherproofing is required, see below.

The following describes the connection of the GPS antenna which is installed directly to the top of the unit.

1. Unscrew the protective dust cap from the GPS antenna jack prior to mounting on the AirSpeed 2900.
2. Align the GPS jack with the plug attached to the top panel on the AirSpeed 2900 and screw on.

#### 3.1.1 Weather-proofing the GPS Antenna Connection

Weather-proofing of the GPS antenna connection is required. This is done with a layer of self-amalgamating tape followed by an over layer of PVC tape. Verify the RF connector is completely weather-sealed.

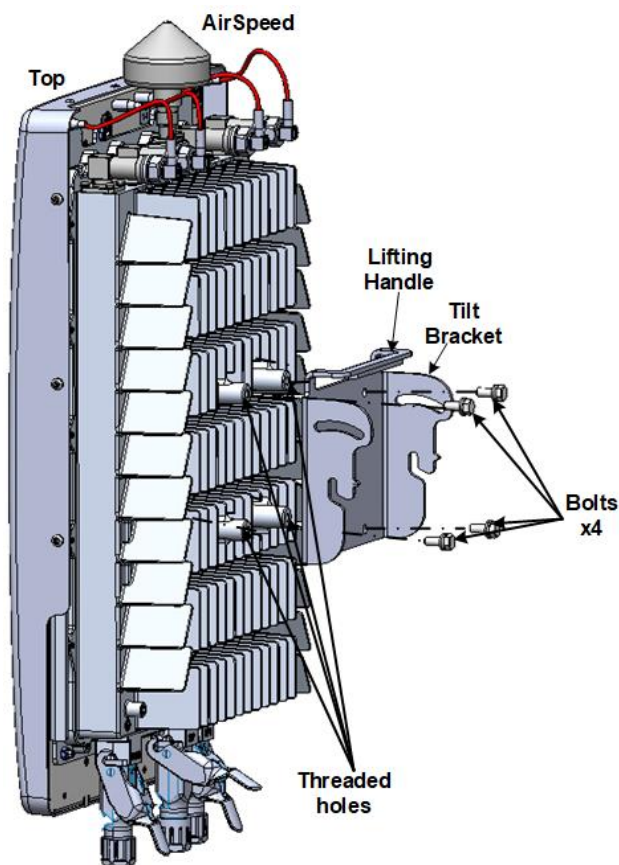
### 3.2 Tilt bracket Assembly

Prior to installation the Tilt bracket must be assembled on the AirSpeed unit, (unless pre-assembled).

1. Lie the unit on its face to expose the back. Careful to protect the surface cover.
2. Orient the Tilt bracket so the lifting handle will be assembled in the direction of the top panel, where the GPS and RF ports are located.
3. Line up the four (4) holes on the Tilt bracket with four (4) threaded holes on the back of the AirSpeed unit.
4. Insert and screw in the four (4) (M6 X 16) screws to tighten (fastening torque of 40 [Lib\*in] = 46 [Kgf\*cm], as shown below.



Figure 5: Tilt bracket Assembly



**!** **Caution:** Do not lift the AirSpeed unit via the cables to avoid damages and faults. Use the provided Lifting Handle on the Tilting bracket.

### 3.3 Pole Mounting Assembly - Clinch Clamps

**i** AirSpeed 2900 can be mounted on poles from in 50 - 250 mm (1.97 to 9.84 inch).

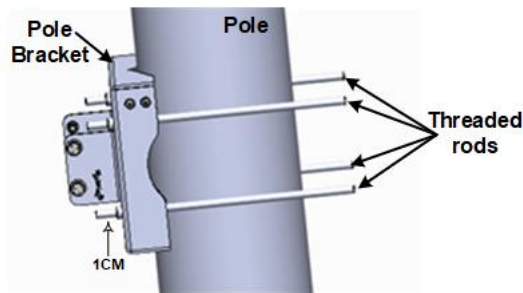
**i** Mount the AirSpeed 2900 unit in an orientation such that the RF connectors are facing up, and power/BH connectors are facing down. This prevents rain water from settling on the port, and thereby, avoiding damage to the unit such as corrosion and electrical short-circuiting.

The following describes the pole mounting procedure:

1. Select the location on the pole to mount the AirSpeed 2900 mounting bracket.
2. Remove the upper two (2) screws from the Pole/Wall bracket and set them aside, they will be inserted later in the upper holes of the bracket. Loosen the lower two (2) screws so they protrude from the Pole/Wall bracket.
3. Screw the four (4) 5/16-18 threaded rods into the threads on the back bracket.
4. Allow the threaded rods to protrude through the back bracket at least 1/2 inch (< 1 cm).

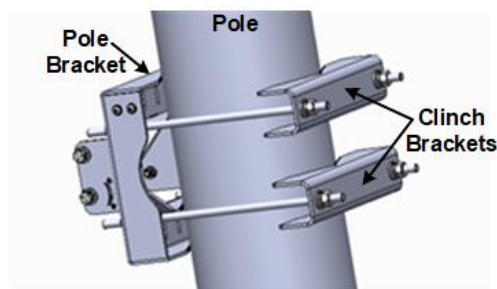
5. Position the mounting bracket onto the pole at the required height as shown below:

Figure 6: Position on Pole



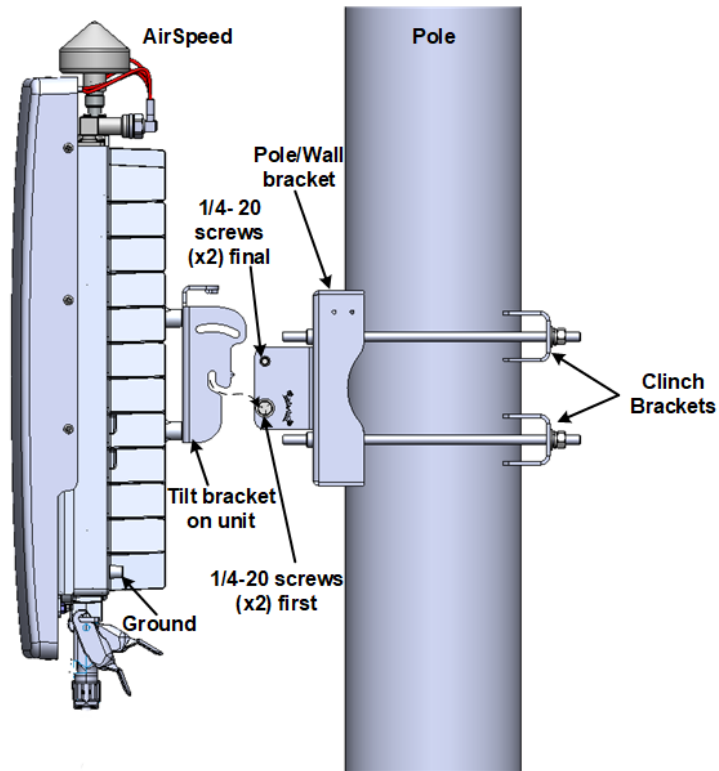
6. Insert a clinch clamp on the two (2) upper threaded rods and put on washers and nuts and hand tighten.
7. Insert the bottom clinch clamp on the two (2) lower threaded rods and put on washers and nuts and hand tighten, as shown below:

Figure 7: Mounting Bracket on Pole



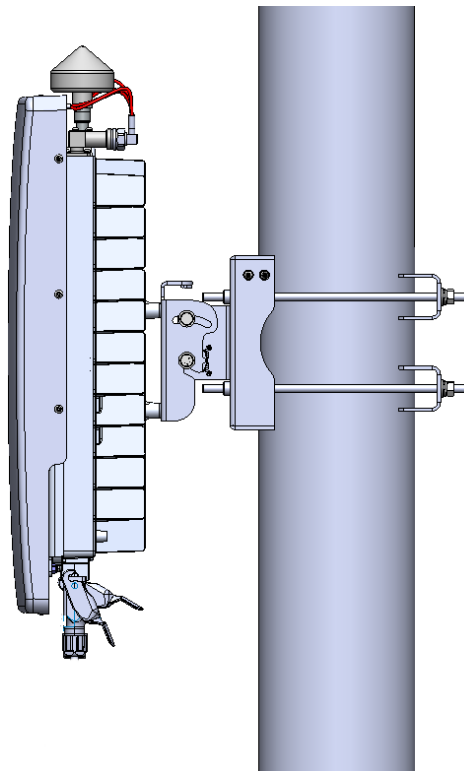
8. Tighten all four (4) nuts. Fastening torque of 132 [Lib\*in] = [151.8 kgf\*cm].
9. Using the lifting handle, carefully lift and align and position the unit so that the lower screws (1 on each side) fit into the notched grooves provided on the back bracket (pre-assembled on the unit) and hand tighten. Insert the upper 1/4-20 screws, washers and nuts (supplied) and fasten the back bracket to the mounting bracket.
10. Carefully align and position the unit so that the screws (1 on each side) fit into the notched grooves provided on the Tilt bracket (pre-assembled on the unit) and hand tighten. Insert the 1/4-20 screws, washers and nuts (supplied) and fasten the Tilt bracket (pre-assembled on the unit) to the mounting bracket.
11. Check and tighten all fixing screws. (Tighten to a torque of no more than 12.5 Nm (9.22 ft-lb) max.).

Figure 8: Pole Mounting Assembly



The following displays the AirSpeed 2900 mounted on a pole.

Figure 9: Mounted on Pole – Clinch Brackets



## 3.4 Pole Mounting Assembly – Stainless Steel Bands

The following describes the pole mounting procedure utilizing the Stainless Steel Bands option:



The AirSpeed 2900 unit can be attached to any pole from 50 to 250mm (2.0 to 9.84 inch) diameter.



Mount the AirSpeed 2900 unit in an orientation such that the RF connectors are facing up, and power/BH connectors are facing down. This prevents rain water from settling on the port, and thereby, avoiding damage to the unit such as corrosion and electrical short-circuiting.

1. Select the location on the pole to mount the AirSpeed 2900 mounting bracket.
2. Position the mounting bracket onto the pole at the required height.
3. Remove the upper two (2) screws from the Pole/Wall bracket and set them aside, they will be inserted later in the upper holes of the bracket. Loosen the lower two (2) screws so they protrude from the Pole/Wall bracket.
4. Insert the clamp bands by passing them through the upper and lower slots in the bracket, in two (2) places.
5. Assemble the 2 SEMS screws (M6 x 16) into the lower threaded holes on the mounting (base) bracket, do not tighten.
6. Carefully align and position the unit so that the screws (1 on each side) fit into the notched grooves provided on the back bracket (pre-assembled on the unit) and hand tighten. Insert the M6 x 16 screws, washers and nuts (supplied) and fasten the back bracket (pre-assembled on the unit) to the mounting bracket.
7. Check and tighten all fixing screws. (Tighten to a torque of no more than 12.5 Nm (9.22 ft-lb) max.).

Figure 10: Pole Mounting - Maxi Clamps SS Bands

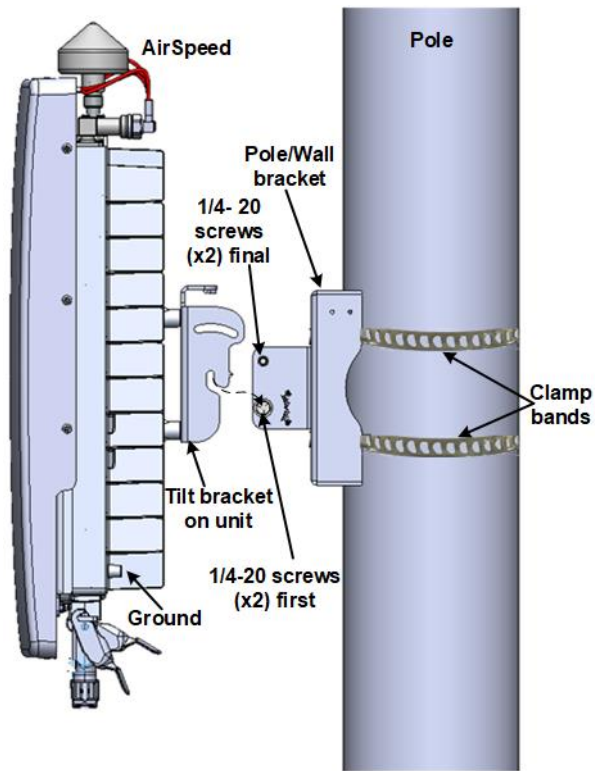
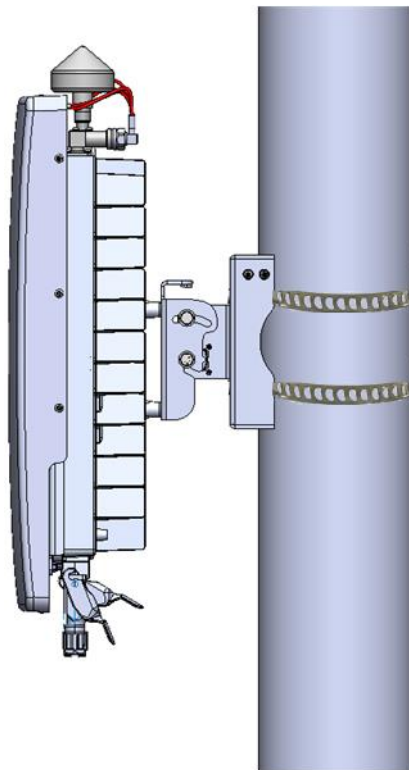


Figure 11: Mounted on Pole - SS Bands



## 3.5 Wall Mount Assembly

The following describes the wall mounting procedure:

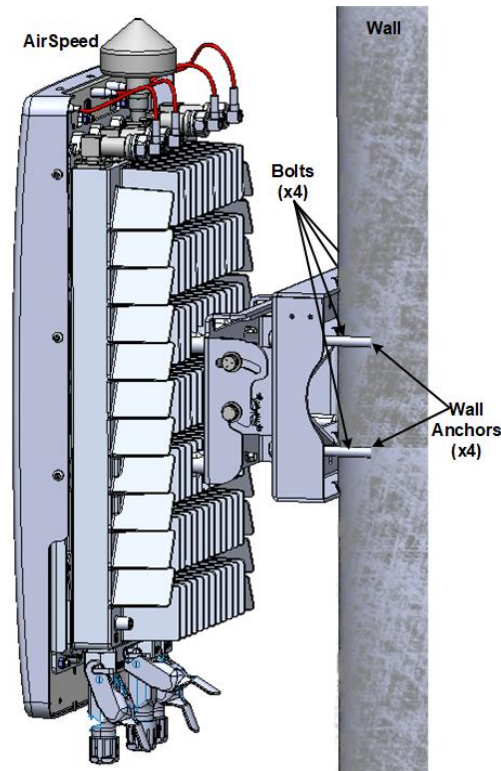
1. Select the location on the wall to mount the AirSpeed 2900 mounting bracket.
2. Remove the upper two (2) screws from the Pole/Wall bracket and set them aside, they will be inserted later in the upper holes of the bracket. Loosen the lower two (2) screws so they protrude from the Pole/Wall bracket.
3. Position the Pole/Wall bracket onto the wall at the required height and mark where to drill the holes.
4. Insert screws and appropriate wall anchors (not provided) and tighten in place. Maximum screw size = ¼”.
5. Assemble the 2 SEMS screws (M6 x 16) into the lower threaded holes on the mounting (base) bracket, do not tighten.



Wall anchors (x4) and necessary hardware are not supplied by Airspan and are the responsibility of the installer. Use appropriate wall anchors according to field conditions.

6. Carefully align and position the unit so that the screws (1 on each side) fit into the notched grooves provided on the Tilt bracket (pre-assembled on the unit) and hand tighten. Insert the 1/4-20 screws, washers and nuts (supplied) and fasten the Tilt bracket (pre-assembled on the unit) to the mounting bracket.
7. Check and tighten all fixing screws. (Tighten to a torque of no more than 12.5 Nm (9.22 ft-lb) max.)

Figure 12: AirSpeed on Wall



### 3.6 Tilt Adjustment

On the AirSpeed 2900 it is possible, after assembly to adjust the unit's tilt, either up or down. This allows for maximum system optimization and reduce interference while increasing coverage. There are adjustment slots located on the sides of unit body where it is attached to the Mounting bracket.

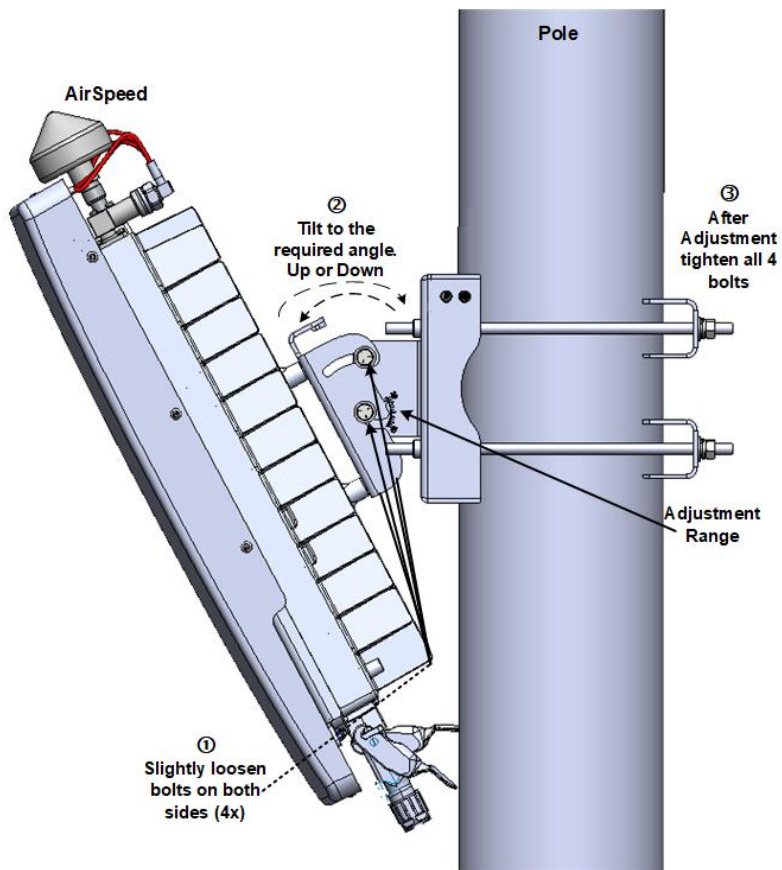


The AirSpeed 2900 unit body has a yield of a maximum tilt of +20° (up) and -30° (down).

Once the AirSpeed unit is mounted in place and a tilt adjustment is needed:

1. Slightly (①) loosen the four (4) bolts on both sides of the mounting bracket.
2. Adjust (②) the unit to the required tilt.
3. After adjustment to the required tilt (③) tighten all four (4) bolts on both sides. Fastening torque of 75 [Lib\*in] = [85 kgf\*cm]

Figure 13: Tilt Adjustment





## 4 Connect and Manage Cables

The following section explains the grounding procedure, cable preparation, external antenna assembly and general instructions on how to connect the DC power cable and the Fiber Ethernet (SFP) cable to the AirSpeed 2900 unit.



Grounding cable, Fiber Ethernet cable, SFP connector adaptor and DC power cables are not supplied as part of the AirSpeed 2900 and can be ordered separately.

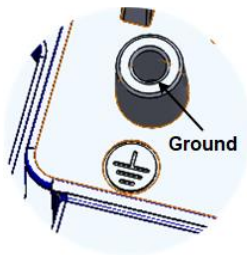
### 4.1 Grounding

The AirSpeed 2900 requires a secure ground connection and a grounding screw fitted with a flat washer and lock washer is provided on the back and clearly marked with the universal ground symbol.

The cable (not supplied) should be grounded and bonded according to international or local standards.

---

Figure 14: Ground Connection



## 4.2 LED Display

Two LEDs are displayed on the inside of the panel of the unit, providing unit status indication - reporting system status: System / Access, Backhaul.

These are software controlled to provide a visual indication to the Installer and is illuminated once power is applied to the unit. It can be turned off during normal operation.

When powering up refer to the following table for indication of current status:

Table 8: Status LED Display

State Name	Color	Status	Description
Powering Up	White	On Continuously	The unit is powering up.
Software loading	Green	Blinking (4Hz)	The unit is loading its SW.
Unit up with RF off	Blue	On Continuously	The unit is Up and RF is Off. Configured by the operators to RF off on <b>all</b> cells.
Normal Operation	Green	On Continuously	Normal operation (Radiating on at least one of the cells).
			The LEDs will be switched off after 10 minutes.
Major Alarm	Orange	On Continuously	Major alarm indication. Service is <u>not</u> affected.
Critical Alarm	Red	On Continuously	Critical alarm indication. Service is affected.

Table 9: BH LED Display

State Name	Color	Status	Description
Powering Up	White	On Continuously	The unit is powering up.
Software loading	Green	Blinking (4Hz)	The unit is loading its SW, physical link is OK. A 60 sec timer will be triggered and in the event that the link is not established the LED will turn red. This can take a few seconds.
Normal Operation	Green	On Continuously	Normal operation (at least 1 backhaul port link is OK)
			The LEDs will be switched off after 10 minutes.
Critical alarm	Red	On Continuously	Critical alarm indication. Service is affected.

### 4.3 Single Mode LC Cable Insertion



The fiber cable to be used is Single Mode fiber with LC connector. The SFP used inside the product is Finisar FTLF1318P3BTL so make sure the other side can interoperate with this SFP.

The following displays the proper steps for SFP cable preparation:



Optical Fiber Cable - Diameter – 4.8mm to 6.8mm

1. Have the pre-assembled LC connector Single Mode fiber cable ready.

Figure 15: Pre-assembled Single Mode LC Cable



2. Remove the caps from the LC connector.
3. Insert the LC connector of the Single Mode fiber cable into the connector. Verify when engaged.

### 4.4 DC Cable Preparation

The following demonstrates the recommended assembly instructions, hardware and tool requirements for the proper DC cable assembly used by Airspan products.



Power Cable:

- Diameter - 8.4mm to 9.4mm
- Wire Size - AWG16 to AWG14



Safety - Disconnection of power supply

- When AirSpeed unit is connected directly to wiring a suitably rated and easily accessible circuit breaker shall be incorporated externally to the equipment.
- Power source disconnection is required before disconnecting the power connector.



**WARNING: This unit incorporates Double Pole/Neutral Fusing. Both the Line & Neutral have fuses in them.**

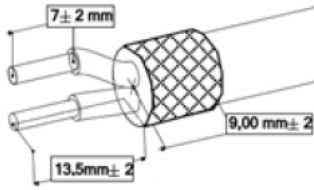


**WARNING: The onsite source circuit breaker (6A) should be gang operated, two (2) pole (single phase type).**

The following displays the proper steps for DC cable preparation:

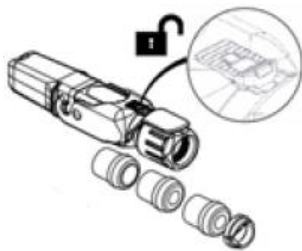
1. Strip back and remove the outer sheath to a length of  $9.0\text{mm} \pm 2$  (0.35 in) to expose the inner insulated wires to a length of  $13.5\text{mm} \pm 2$  (0.53 in). Then strip back  $7\text{mm} \pm 2$  (0.27 in) of the inner core insulation.

Figure 16: Stripping Dimensions (DC Cable)



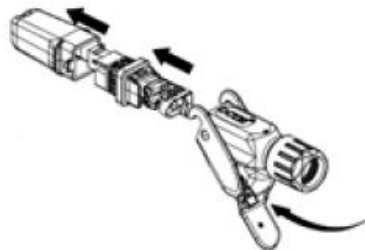
2. Open the housing lock by sliding up then lift the clamp handle.

Figure 17: Open Housing Lock



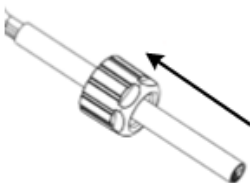
3. Separate the housing into its component sections.

Figure 18: Separate into Sections



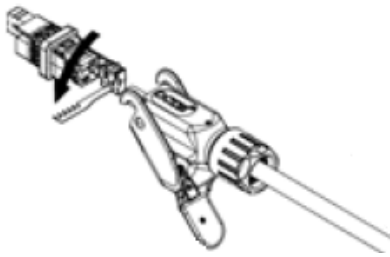
4. Insert the Gland nut through the other end of the cable.

Figure 19: Insert Gland Nut



5. Loosen the strap clamp and feed the prepared end of the source power cable into the inner part of the DC connector housing.

Figure 20: Pass DC Cable Thru



6. Secure the prepared ends of the cable into the inner part of the connector housing and tighten the 2 screws.



Verify the wire polarity before securing, as shown in figure 19.

Figure 21: Power Wire Connection

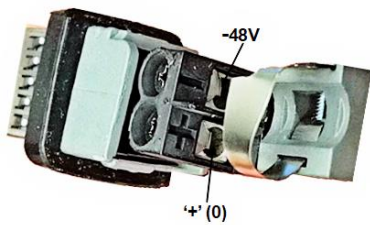
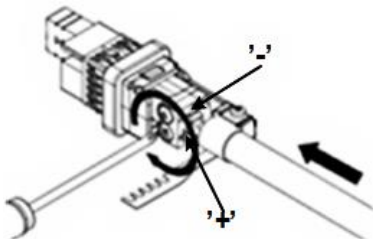
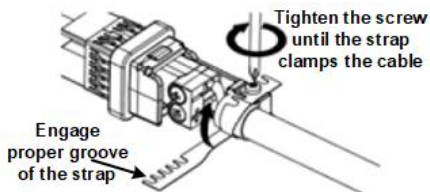


Figure 22: Tightening of Set Screws



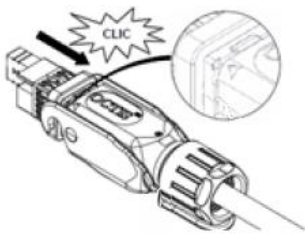
7. Tighten the strap clamp screw as shown below.

Figure 23: Tighten the Strap Clamp



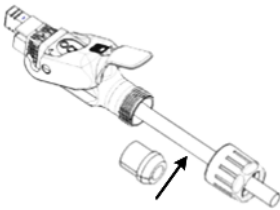
8. Insert into outer housing until “click” in place, align marks for proper alignment.

Figure 24: Align Marks + Click in Place



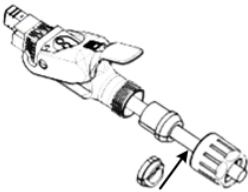
9. Place the split rubber gland onto the cable.

Figure 25: Place Split Rubber Gland



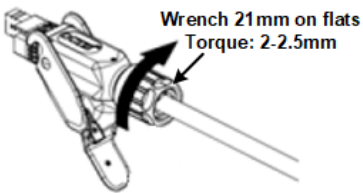
10. Place the tightening cone onto the split rubber gland.

Figure 26: Place Tightening Cone on Split Gland



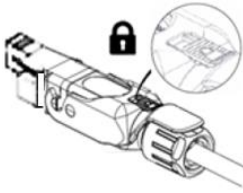
11. Tighten the gland nut with a 21mm wrench, to a torque of no more than 2-2.5 Nm (1.47 – 1.84 ft-lb) max.

Figure 27: Tighten gland Nut



12. Insert the connector into the Power port on the bottom of the chassis. Verify that the connector's latch faces the rear of the unit to enable potential unlocking.
13. Close the lever and secure the lock by sliding the secondary lock/button, so that lever can't be lifted.

Figure 28: Secure Housing Lock



When securing the cable verify there is no tension on the connector so that it is easy to disconnect and re-connect for future maintenance actions.



Verify that there is no gap between the (square rubber) gasket and the connector when inserted.

Maintain even pressure so that the connector is fully seated and the latch engages the projections on the sides.

Confirm that the connector is fully inserted as far in as it can go before closing the latch.



## Appendix A. Installation Checklist

During installation, review and perform all the steps on this checklist (in the given order). This checklist is meant for the person who performs the AirSpeed 2900 installation.



To make sure you complete all the tasks, detach or print this checklist and use it as a job aid. After performing, check off each task.

Procedure	Action	Check If Performed
Verify the prerequisites	Verify the site requirements.	<input type="checkbox"/>
	Verify the installation requirements.	<input type="checkbox"/>
	Verify the tool requirements.	<input type="checkbox"/>
	Verify the parts & kits required.	<input type="checkbox"/>
AirSpeed 2900 installation	Install Tilt bracket on the AirSpeed 2900. Install the GPS antenna on the unit.	<input type="checkbox"/>
	Install the Pole/Wall bracket on the Pole or Wall.	<input type="checkbox"/>
	Install AirSpeed 2900 on the mounting bracket (as required).	<input type="checkbox"/>
Connect & manage Cables	Connect Ground, SFP & Ethernet cable(s)	<input type="checkbox"/>
Connect power system	Connect power cable	<input type="checkbox"/>

## Appendix B. Abbreviations

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Table 10: ABBREVIATIONS & DEFINITIONS

Term	Expansion
dB	Decibel. A logarithmic unit used to describe a ratio (such as power ratio in radio telecommunications)
dBm	An abbreviation for the power ratio in decibels (dB) of the measured power referenced to one milliwatt (mW). It is used as a convenient measure of absolute power because of its capability to express both very large and very small values in a short form
gNB	Next generation NodeB
OD	Outdoor