NNH4-65B-R6H4

12-port sector antenna, 4x 698–896 and 8x 1695–2360 MHz, 65° HPBW, 6x RET

- Features broadband Low Band (698-896 MHz) and High Band (1695-2360 MHz) arrays for 4T4R (4X MIMO) capability for Band 14, AWS, PCS and WCS applications
- Non-stacked high band array design provides higher gain and narrower vertical beamwidth than traditional antenna designs.
- Independent tilt for all arrays.
- Array configuration provides capability for 4T4R (4x MIMO) on Low band and Dual 4T4R (4x MIMO) on High band
- Optimized SPR performance across all operating bands
- Excellent wind loading characteristics
- Supports re-configurable antenna sharing capability enabling control of the internal RET system using up to two separate RET compatible OEM radios

General Specifications

Antenna Type	Sector
Band	Multiband
Color	Light gray
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Performance Note	Outdoor usage | Wind loading figures are validated by wind tunnel measurements described in white paper WP-112534-EN
Radome Material	Fiberglass, UV resistant
Radiator Material	Low loss circuit board
Reflector Material	Aluminum
RF Connector Interface	4.3-10 Female
RF Connector Location	Bottom
RF Connector Quantity, high band	8
RF Connector Quantity, low band	4
RF Connector Quantity, total	12

Remote Electrical Tilt (RET) Information

RET Hardware	CommRET v2
RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	2 female | 2 male

NNH4-65B-R6H4

Input Voltage	10–30 Vdc
Internal RET	High band (4) | Low band (2)
Power Consumption, active state, maximum	8 W
Power Consumption, idle state, maximum	1 W
Protocol	3GPP/AISG 2.0 (Multi-RET)

Dimensions

Width	498 mm | 19.606 in
Depth	197 mm | 7.756 in
Length	1828 mm | 71.969 in
Net Weight, without mounting kit	34 kg | 74.957 lb

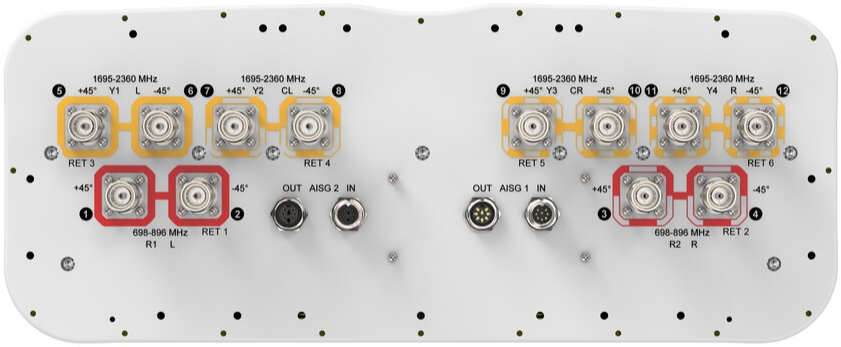
Array Layout

Array	Freq (MHz)	Conns	RET (MRET)	AISG RET UID
R1	698-896	1-2	1	CPxxxxxxxxxxxxxxxxmm.1
R2	698-896	3-4	2	CPxxxxxxxxxxxxxxxxmm.2
Y1	1695-2360	5-6	3	CPxxxxxxxxxxxxxxxxmm.3
Y2	1695-2360	7-8	4	CPxxxxxxxxxxxxxxxxmm.4
Y3	1695-2360	9-10	5	CPxxxxxxxxxxxxxxxxmm.5
Y4	1695-2360	11-12	6	CPxxxxxxxxxxxxxxxxmm.6

(Sizes of colored boxes are not true depictions of array sizes)

Port Configuration

NNH4-65B-R6H4



Electrical Specifications

Impedance	50 ohm
Operating Frequency Band	1695 – 2360 MHz | 698 – 896 MHz
Polarization	±45°
Total Input Power, maximum	900 W @ 50 °C

Electrical Specifications

Frequency Band, MHz	**698–806**	**806–896**	**1695–1880**	**1850–1990**	**1920–2180**	**2300–2360**
Gain, dBi	14.2	14.8	16.7	17.3	17.9	18.4
Beamwidth, Horizontal, degrees	68	64	70	67	61	59
Beamwidth, Vertical, degrees	11.5	10.2	6.9	6.5	6	5.4
Beam Tilt, degrees	2–14	2–14	2–12	2–12	2–12	2–12
USLS (First Lobe), dB	16	18	16	19	19	19
Front-to-Back Ratio at 180°, dB	30	30	33	34	34	34
Isolation, Cross Polarization, dB	25	25	25	25	25	25
Isolation, Inter-band, dB	25	25	25	25	25	25
VSWR | Return loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0

PIM, 3rd Order, 2 x 20 W, dBc	-150	-150	-150	-150	-150	-150
Input Power per Port at 50°C, maximum, watts	300	300	250	250	250	200

Electrical Specifications, BASTA

Frequency Band, MHz	**698–806**	**806–896**	**1695–1880**	**1850–1990**	**1920–2180**	**2300–2360**
Gain by all Beam Tilts, average, dBi	13.8	14.5	16.1	16.9	17.5	18
Gain by all Beam Tilts Tolerance, dB	±0.6	±0.5	±0.7	±0.6	±0.6	±0.5
Gain by Beam Tilt, average, dBi	2 ° | 14.0 8 ° | 13.9 14 ° | 13.5	2 ° | 14.6 8 ° | 14.6 14 ° | 14.1	2 ° | 15.9 7 ° | 16.2 12 ° | 16.0	2 ° | 16.6 7 ° | 17.0 12 ° | 16.9	2 ° | 17.1 7 ° | 17.6 12 ° | 17.4	2 ° | 17.7 7 ° | 18.0 12 ° | 17.9
Beamwidth, Horizontal Tolerance, degrees	±5.7	±3.2	±6.4	±7.5	±5.9	±3.6
Beamwidth, Vertical Tolerance, degrees	±0.9	±0.7	±0.5	±0.3	±0.4	±0.2
USLS, beampeak to 20° above beampeak, dB	16	15	12	15	15	16
Front-to-Back Total Power at 180° ± 30°, dB	20	21	27	26	27	28
CPR at Boresight, dB	24	23	19	19	20	17
CPR at Sector, dB	12	10	7	5	6	8

Mechanical Specifications

Effective Projective Area (EPA), frontal	0.65 m² | 6.997 ft²
Effective Projective Area (EPA), lateral	0.22 m² | 2.368 ft²
Wind Loading @ Velocity, frontal	694.0 N @ 150 km/h (156.0 lbf @ 150 km/h)
Wind Loading @ Velocity, lateral	235.0 N @ 150 km/h (52.8 lbf @ 150 km/h)
Wind Loading @ Velocity, maximum	900.0 N @ 150 km/h (202.3 lbf @ 150 km/h)
Wind Loading @ Velocity, rear	571.0 N @ 150 km/h (128.4 lbf @ 150 km/h)
Wind Speed, maximum	241.402 km/h | 150 mph

Packaging and Weights

Width, packed	608 mm | 23.937 in
Depth, packed	352 mm | 13.858 in
Length, packed	2030 mm | 79.921 in
Weight, gross	47.8 kg | 105.381 lb

NNH4-65B-R6H4

Regulatory Compliance/Certifications

Agency	Classification
CHINA-ROHS	Above maximum concentration value
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system
ROHS	Compliant/Exempted

Included Products

BSAMNT-3	–	Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

8-Port Antenna	R1	R2	Y1	Y2
Frequency Range	698–960	698–960	1695–2690	1695–2690
Dual Polarization	X	X	X	X
HPBW	65°	65°	65°	65°
Adjust. Electr. DT	2°–12°	2°–12°	2.5°–12°	2.5°–12°

set by *FlexRET*

KATHREIN

AISG Antenna Interface Standards Group

8-Port Antenna 698–960/698–960/1695–2690/1695–2690 65°/65°/65°/65° 15.5/15.5/18/18dBi 2°–12°/2°–12°/2.5°–12°/2.5°–12°T

Type No.		80010965			
Left side, lowband		R1, connector 1–2			
		698–960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	14.8	15.4	15.6	15.9
Gain over all Tilts	dBi	14.8 ± 0.6	15.4 ± 0.4	15.6 ± 0.2	15.8 ± 0.2
Horizontal Pattern:					
Azimuth Beamwidth	°	62 ± 3.9	61 ± 3.2	60 ± 2.7	60 ± 2.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 25	> 27	> 25
Vertical Pattern:					
Elevation Beamwidth	°	11.9 ± 0.8	11.0 ± 0.8	10.5 ± 0.4	10.2 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.7	< 0.7	< 0.7	< 0.7
First Upper Side Lobe Suppression	dB	> 14	> 14	> 15	> 14
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R1 // R2) > 30 (R1 // Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1–2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

936.5306/b.1 ngmn 04.24.02.03 Subject to alteration.

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Right side, lowband		R2, connector 3–4			
		698–960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	14.8	15.3	15.5	15.8
Gain over all Tilts	dBi	14.8 ± 0.6	15.3 ± 0.3	15.5 ± 0.3	15.7 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	63 ± 3.6	62 ± 1.8	62 ± 2.1	60 ± 3.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 26	> 27
Vertical Pattern:					
Elevation Beamwidth	°	11.6 ± 0.7	11.0 ± 0.6	10.7 ± 0.4	10.2 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.7	< 0.6	< 0.6	< 0.5
First Upper Side Lobe Suppression	dB	> 14	> 16	> 16	> 16
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R2 // R1) > 30 (R2 // Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 3–4	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5–6				
		1695–2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.6	17.9	18.3	18.1	18.1
Gain over all Tilts	dBi	17.5 ± 0.4	17.8 ± 0.4	18.1 ± 0.5	18.0 ± 0.6	18.0 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 5.1	65 ± 4.1	62 ± 7.2	56 ± 4.1	57 ± 5.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 25	> 25	> 25	> 25
Vertical Pattern:						
Elevation Beamwidth	°	6.4 ± 0.5	5.9 ± 0.3	5.5 ± 0.4	4.8 ± 0.3	4.4 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.1	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 18	> 16	> 18	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5–6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

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Right side, highband		Y2, connector 7–8				
		1695–2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.5	18.0	18.3	18.2	17.9
Gain over all Tilts	dBi	17.4 ± 0.4	17.8 ± 0.4	18.1 ± 0.6	18.0 ± 0.7	17.8 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 4.7	66 ± 4.7	62 ± 7.8	57 ± 3.8	59 ± 7.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 26	> 26	> 25	> 24
Vertical Pattern:						
Elevation Beamwidth	°	6.4 ± 0.4	5.9 ± 0.3	5.5 ± 0.5	4.8 ± 0.3	4.4 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 18	> 18	> 15	> 17	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7–8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

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Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 27
Passive Intermodulation	dBc	< –153 (2 x 43 dBm carrier)
Polarization	°	+45, –45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input		8 x 4.3-10 female
Connector Position		bottom
Adjustment Mechanism		FlexRET, continuously adjustable
Wind load (at Rated Wind Speed: 150 km/h) (93 mph)	N | lbf	Frontal: 1130 | 254 Maximal: 1140 | 256 Lateral: 200 | 45
EPA (m^2 | ft^2)		Front: 1.041 | 11.21 Lateral: .183 | 1.97
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1999 / 508 / 175 78.7 / 20.0 / 6.9
Category of Mounting Hardware		XH (X-Heavy)
Weight	kg lb	44.3 / 49.3 (clamps incl.) 97.6 / 108.6 (clamps incl.)
Packing Size	mm inches	2200 / 542 / 268 86.6 / 21.3 / 10.6
Scope of Supply		Panel, FlexRET and clamps for 55–115 mm | 2.2–4.5 inches diameter

Accessories (order separately if required)

Type No.	Description	Remarks mm | inches	Weight approx. kg | lb	Units per antenna
85010097	2 clamps	Mast diameter: 110 – 220 | 4.3 – 8.7	9.4 | 20.7	1
85010099	1 downtilt kit	Downtilt angle: 0° – 13°	10.6 | 23.4	1
86010154	Site Sharing Adapter	3-way (see figure below)	0.7 | 1.5	
86010155	Site Sharing Adapter	6-way (see figure below)	1.4 | 3.1	
86010162	Gender Adapter	Solely to be used in combination with the FlexRET module 86010153V01	0.045 | 0.099	1
86010163	Port Extender		0.16 | 0.35	1

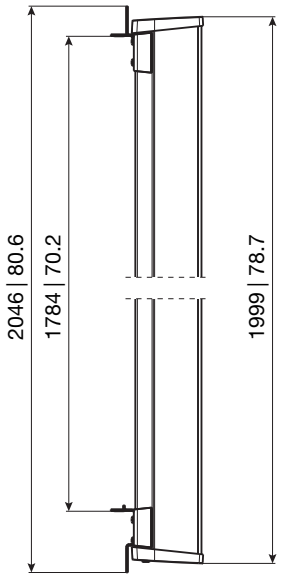
Accessories (included in the scope of supply)

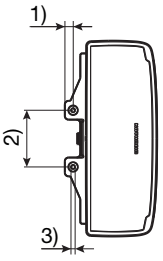
85010096	2 clamps	Mast diameter: 55 – 115 | 2.2 – 4.5	5.0 | 11.0	1
86010153V01	FlexRET			1

For downtilt mounting use the clamps for an appropriate mast diameter together with the downtilt kit.
Wall mounting: No additional mounting kit needed.

Material: **Reflector screen:** Aluminum.
Fiberglass housing: It covers totally the internal antenna components. The special design reduces the sealing areas to a minimum and guarantees the best weather protection. Fiberglass material guarantees optimum performance with regards to stability, stiffness, UV resistance and painting. The color of the radome is light grey.
All nuts and bolts: Stainless steel or hot-dip galvanized steel.

Grounding: The metal parts of the antenna including the mounting kit and the inner conductors are DC grounded.

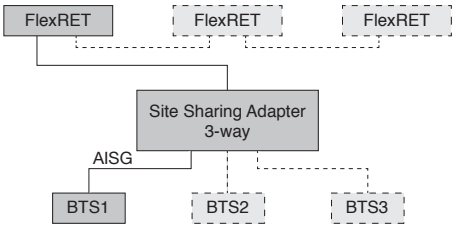




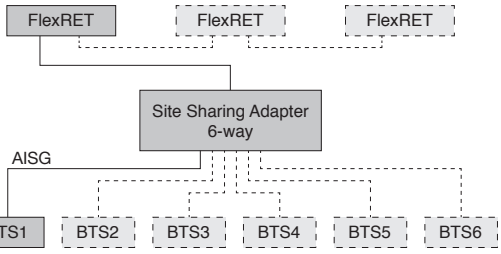
1) 22 | 0.9
2) 150 | 5.9
3) ∅ 11 | 0.4

All dimensions in mm | inches

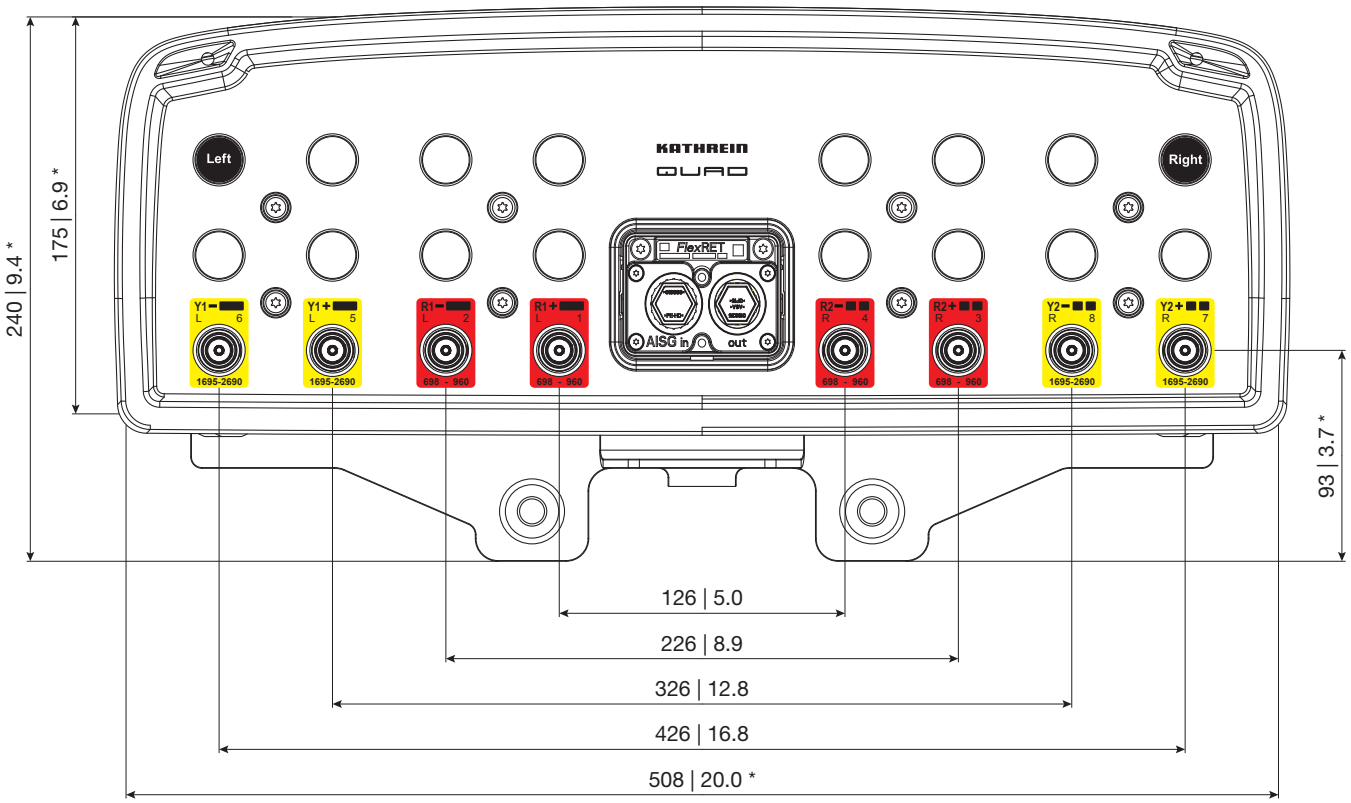
Configuration example with Site Sharing Adapter 86010154



Configuration example with Site Sharing Adapter 86010155



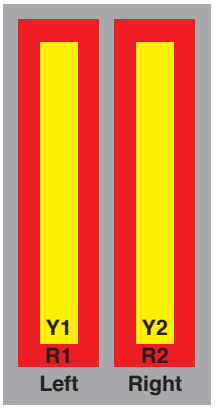
Layout of interface:



Bottom view
* Dimensions refer to radome
All dimensions in mm | inches

Correlation Table

Frequency range	Array	Connector
698– 960 MHz	R1	1–2
698– 960 MHz	R2	3–4
1695–2690 MHz	Y1	5–6
1695–2690 MHz	Y2	7–8



Order Information

Model	Description
80010965	8-Port antenna with mounting bracket
80010965K	8-Port antenna with mounting bracket and mechanical tilt bracket

Any previous data sheet issues have now become invalid.

All specifications are subject to change without notice.
The latest specifications are available at www.kathreinusa.com

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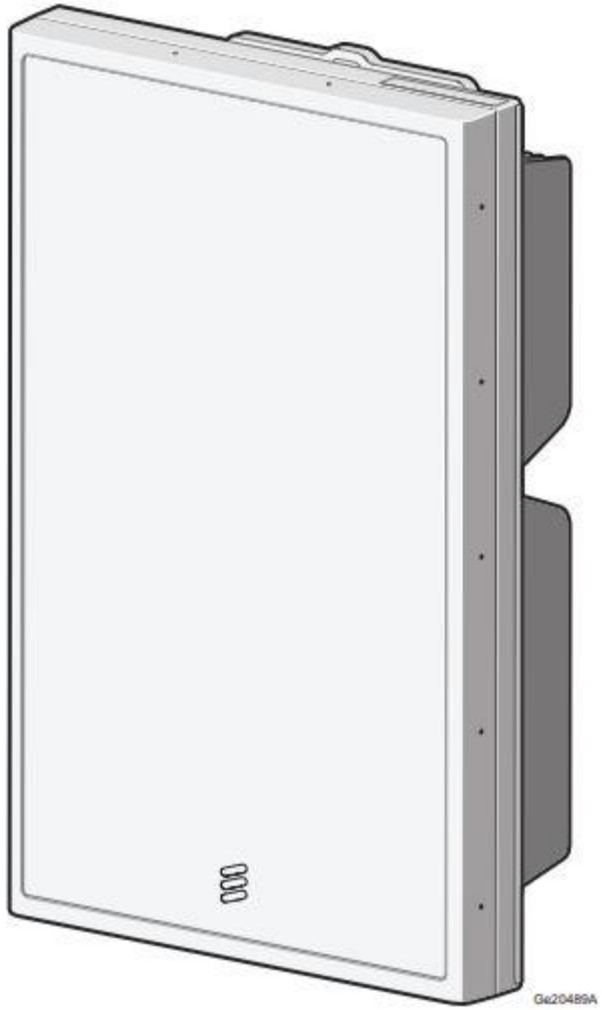
ERICSSON AIR 6419 DATA SHEET

For Turf Vendors

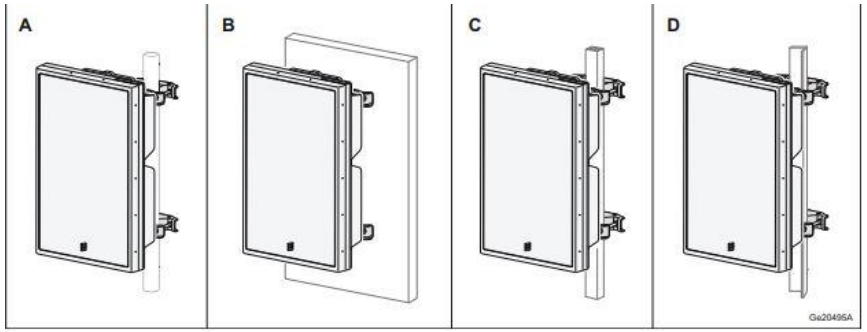
2021-07-22 Rev B

ERICSSON AIR 6419 B77G

- ERICSSON AIR 6419 has a total of 2 ECPRI connections @ 25.8 Gbps, 1 DC Power cable connection
- Operates over B77G DOD band (3.4-3.6 GHz)
- Breaker size = 45A DC, DC Power Consumption = 1280W (for dimensioning)
- Dimensions
  - Height: 31.1” (790 mm)
  - Width: 16.1” (408 mm)
  - Depth: 7.3” (186 mm)
- Weight, excl. mounting hardware = 44 lbs (20 kg)
- Weight with Mounting Hardware = 55.4 lbs (25.2 kg)
- Max Frontal Wind Load @ 42m/s = 454 N
- Horizontal Separation Required between AIR 6419 = 100mm
- Minimum Vertical Space Required below/above AIR 6419 = 300mm
- Minimum Height Above Users = 5m
- Outdoor Installation locations to avoid:
  - Hot microclimates caused by, for example, heat radiated or reflected from dark or metallic walls or floors
  - Chimney mouths or ventilation system outlets
  - In front of Large glass surfaces or concrete surfaces
- Avoid radio interference by keeping the area directly in front of the antenna clear of metal surfaces such as railing, ladders or chains or equipment generating electromagnetic fields, for example, electric motors in air conditioners or diesel generators in front of antenna
- Do not use metallic paint to cover the AIR 6419 If painting is required. Do not paint underside of AIR 6419.

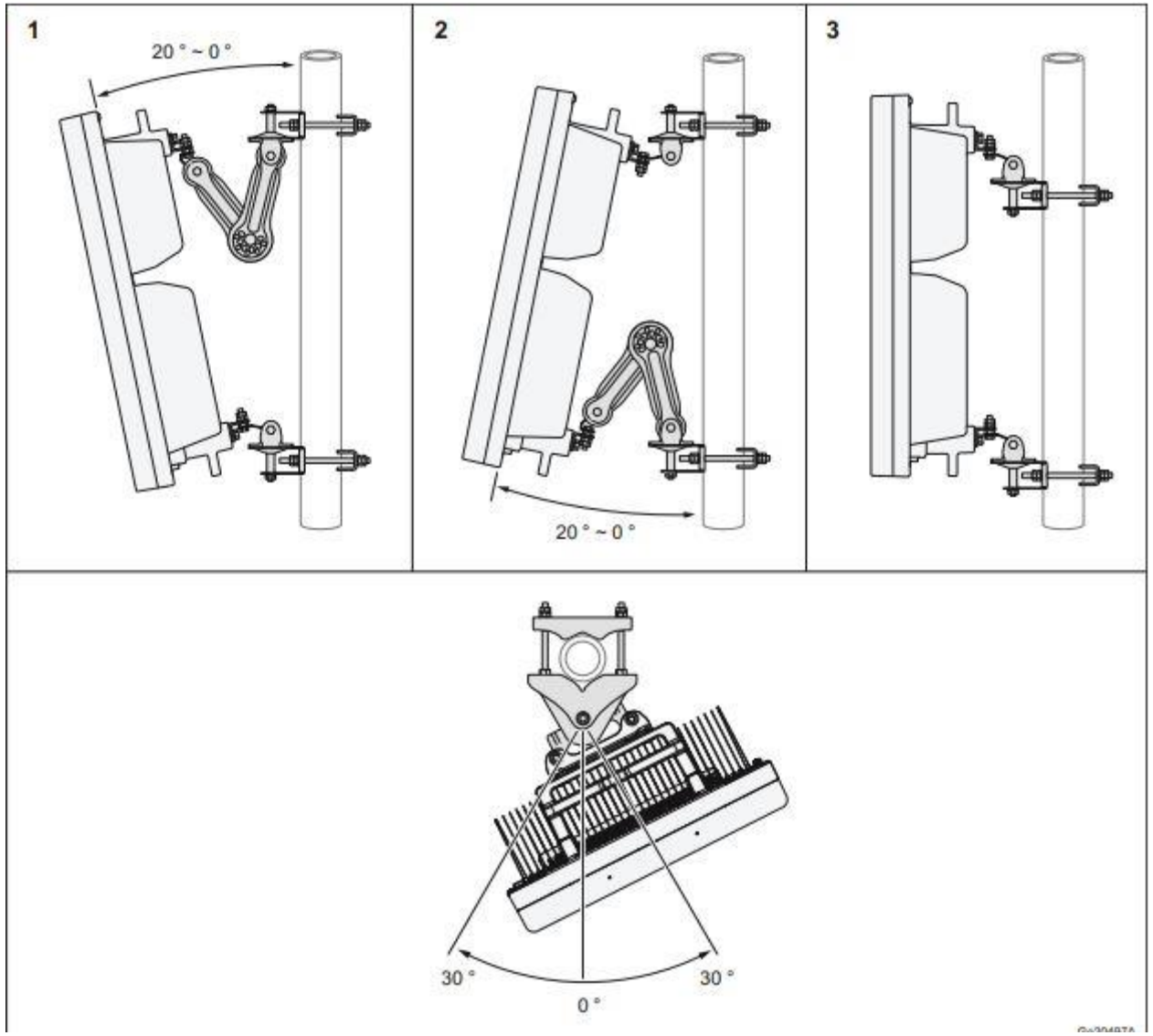


ERICSSON AIR6419 MOUNTING OPTIONS

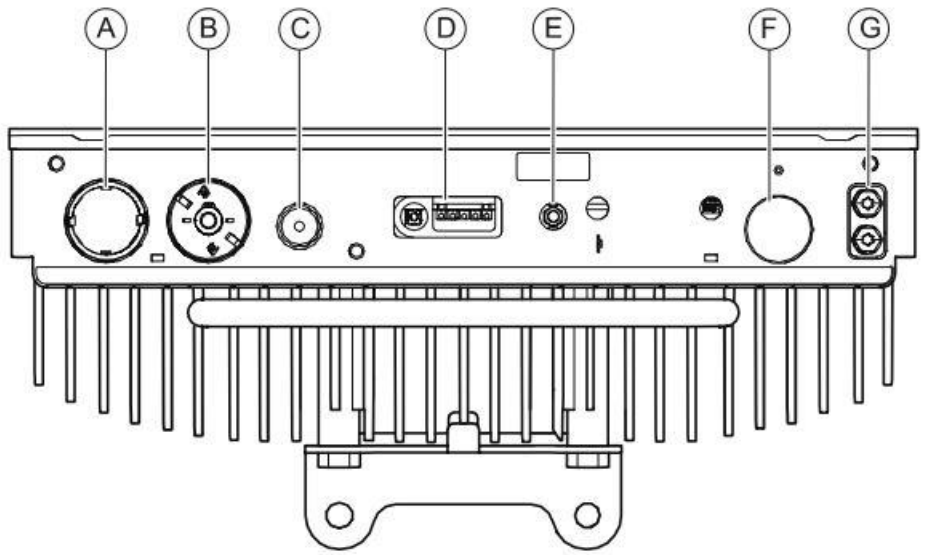


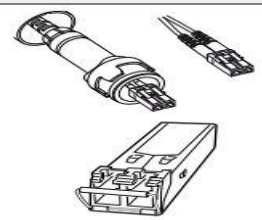
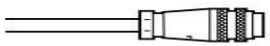
Installation Method	Description
A	Pole installation (pole with circular cross section)
B	Wall installation
C	Pole installation (pole with square cross section)
D	Pole installation (pole with 90° angle cross section)

Pole	Circular	Square	90° Angle
Minimum outer dimension	Ø76 mm	50 × 50 mm	50 × 50 mm
Maximum outer dimension	Ø114 mm	80 × 80 mm	80 × 80 mm



ERICSSON AIR 6419 INTERFACES



Position	Description	Marking	Connector Types	Cable Illustration
A	eCPRI 1	1	LC (On SFP28) with support for FullAXS	
B	eCPRI 2	2		
C	DIN 14 pin, following functions supported: — RAE — EC-light — External alarms		DIN 14 female connector	
	Note: If using more than one function, a Y-cable must be connected to the DIN 14 connector for each added function.			
D	Optical indicators	1, 2	—	—
E	TX Monitor		SMA female connector	
F	−48 V DC power supply	**−48 V**	Power connector	
G	Grounding		2 × 6 mm dual lug	

The AIR 6419 uses type SFP28 for ECPRI connections and must be same SFP type used at radio connection and BBU connection. Data ports are grouped in pairs. Ports 1,2 are a pair. Connection to NR or LTE Baseband must be connected as a pair if two ports are used. Each pair is limited to 100 MHz BW for the assigned carriers, using one or two ports.

ERICSSON

DATA SHEET

DC Surge Protection Solutions - Outdoor Rated

DC6-48-60-18

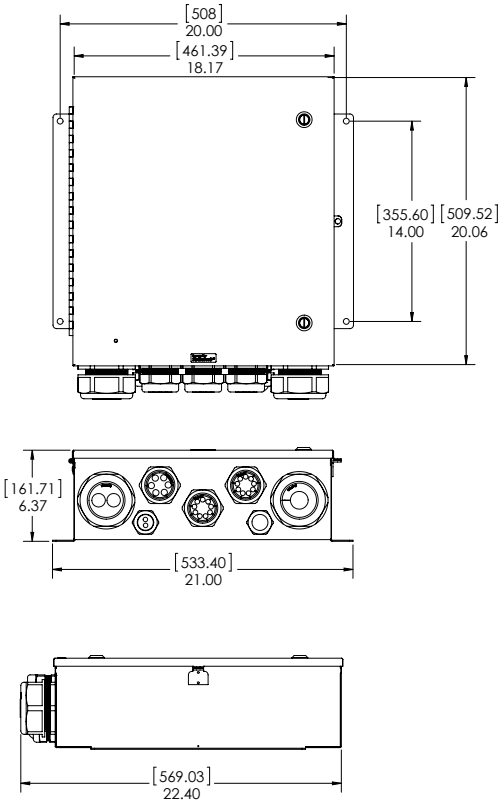
Overvoltage Protection and Fiber Distribution/Cable Management Junction Box

Rooftop / Towertop

The DC6-48-60-18 is designed to be the most robust lightning and power surge protector available for rooftop equipment in distributed node B or e-node B applications. The flexible design provides electrical protection and fiber distribution/cable management at rooftop or towertop sectors. The solution employs the patented Strikesorb® 30-V1-HV surge protective device (SPD), capable of providing 60kA (8/20 µs) of surge capacity for up to 6 -48V DC circuits.

powered by **Strikesorb®**

DC6-48-60-18
ships with Gland Fittings installed



Features

- Provides protection for six individual -48V DC Remote Radio Heads
- Surge protection of 60kA 8/20 µs
- Maximum impulse current 5kA 10/350 µs
- Simplifies inter-connectivity and cable management for DC conductors
- UL 1449 5th Edition Type 2 protective device
- IEC 61643-11 Class I protection for DC applications
- NEMA 4 rated enclosure
- Form C relay contacts included
- Fiber connections for up to 18 pair of fiber
- Supports 12 AWG, 10AWG or 8AWG DC Jumpers
- Patent pending

Benefits

- Strikesorb modules are fully recognized to UL 1449 5th Edition, and IEC 61643-11 Safety Standards, meeting all intermediate and high current fault requirements to facilitate use in original equipment manufacturers (OEM) applications
- Strikesorb offers unique maintenance-free protection against direct lightning currents
- NEMA 4 enclosure allows for indoor or outdoor installation

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SPECIFICATIONS

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DC Surge Protection Solutions - Outdoor Rated

DC6-48-60-18

Overvoltage Protection and Fiber Distribution/Cable Management Junction Box

Electrical

Model Number		DC6-48-60-18
CEQ / ANT Number		ANT. 14481
Number of Circuits Protected		6
Surge Protective Device (SPD) Type per UL 1449 5th Edition		Type 2
Surge Protection Class as per IEC 61643-11		Class I
Nominal Operating DC Voltage [U_n]		48 V
Nominal Discharge Current [I_n] per UL 1449 3rd Edition		20 kA 8/20 µs
Maximum Surge Current [I_{max}] per IEC 61643-11		60 kA 8/20 µs
Maximum Impulse (Lightning) Current [I_{imp}] per IEC 61643-11		5 kA 10/350 µs
Maximum Continuous Operating DC Voltage [U_c] (MCOV)		75 VDC
Voltage Protection Level [U_p] per IEC 61643-11		300 V
Voltage Protection Rating (VPR)		700 V
Suppression Technology		MOV
Strikesorb Module Type 2CA (UL 1449 5th edition)		30-V1-HV
Protection Modes:	Normal Mode	-48V to Return
	Common Mode	Return to Ground

Mechanical

Connection Terminal (Alarm) Method		Form C Hardwired, #22 to #12 AWG [0.34 to 4 mm²]
Connection Terminal (Suppression) Method		Compression lug 2 hole, #10, 5/8 pitch, 12-4 AWG [3.31-21 mm²]
Connection Terminal (Terminal Block) Method	Copper	#14 to #2 AWG [2.5 to 35 mm²]
	Aluminum	#12 to #2 AWG [4 to 35 mm²]
Operating Temperature (°C)		-40° C to +100° C
Storage Temperature (°C)		-70° C to +80° C
Cold Temperature Cycling IEC 61300-2-22		-30° C to +60° C 200 hrs @5 PSI
Resistance to Aggressive Materials CEI IEC 61073-2		Including Acids and Bases
UV Protection ISO 4892-2 Method A		Xenon-Arc 2160 hrs
Enclosure Type		Outdoor - NEMA 4 Rated
Enclosure Dimensions (L x W x H)		18.17" x 20.06" x 6.37" [461.39 x 509.52 x 161.71 mm]
Weight		34.9 lbs [15.83 kg]
Combined Wind Loading	Sustained	150 mph Sustained: 135.3 lbs [601 N]
	Gust	195 mph Gust: 228.6 lbs [1016 N]

Additional Features

2 gland kits
1 conduit kit

Kit A: Installed- Power input to support 8AWG trunks. Power output to support 12AWG jumpers.
Kit B: Power input to support 6AWG trunks. Power output to support 10AWG jumpers.
Kit C: Replace both power and fiber glands with conduit fittings.

Note: Power output to support up to 8AWG 2-conductor and 8AWG Low Inductance also included.

Standards Compliance & Certifications

Strikesorb modules are compliant to the following Surge Protection Device Standards:

Standards: UL 1449 5th Edition: 2021, IEC 61643-11: 2011, EN 61643-11: 2012, IEEE C62.11: 2005, IEEE C62.41: 2002, IEEE C62.45: 2002, NEMA-LS-1

Certifications: UL, VDE, CE

AWG=American Wire Gauge

DATA SHEET

DC Surge Protection Solutions - Outdoor Rated

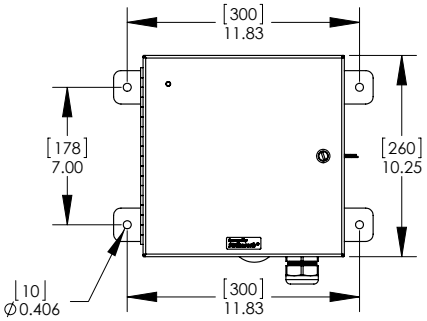
DC2-48-60-0-9E

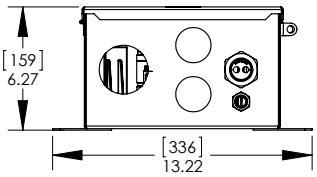
Overvoltage Protection and Cable Management Solution

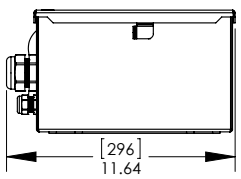
Rooftop / Towertop

powered by **Strikesorb®**

The DC2-48-60-0-9E is designed to be the most robust lightning and power surge protector available for rooftop equipment in distributed node B or e-node B applications. The flexible design provides electrical protection and fiber pass through/cable management at rooftop or towertop sectors. The solution employs the patented Strikesorb® 30-V1-HV surge protective device (SPD), capable of providing 60kA (8/20 µs) of surge capacity for up to 2 -48V DC circuits.





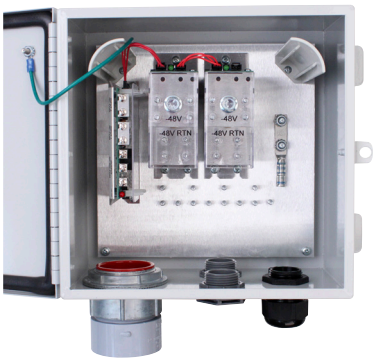


Features

- Provides protection for two individual -48V DC Remote Radio Heads
- Surge protection of 60kA 8/20 µs
- Maximum impulse current 5kA 10/350 µs
- Simplifies inter-connectivity and cable management for DC conductors
- UL 1449 4th Edition Type 4 protective device
- IEC 61643-11 Class I protection for DC applications
- NEMA 4 rated enclosure
- Form C relay contacts included
- Suppressor status alarm feature
- Supports fiber pass through for 4-pair jumper
- Patent pending

Benefits

- Strikesorb modules are fully recognized to UL 1449 4th Edition, and IEC 61643-11 Safety Standards, meeting all intermediate and high current fault requirements to facilitate use in original equipment manufacturers (OEM) applications
- Strikesorb offers unique maintenance-free protection against direct lightning currents
- NEMA 4 enclosure allows for indoor or outdoor installation



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SPECIFICATIONS

powered by **Strikesorb®**

DC Surge Protection Solutions - Outdoor Rated

DC2-48-60-0-9E

Overvoltage Protection and Cable Management Solution

Electrical		
Model Number		DC2-48-60-0-9E
CEQ / ANT Number		ANT. 13885
Number of Circuits Protected		2
Surge Protective Device (SPD) Type per UL 1449 4th Edition		Type 2
Surge Protection Class as per IEC 61643-11		Class I
Nominal Operating DC Voltage [U_n]		48 V
Nominal Discharge Current [I_n] per UL 1449 3rd Edition		20 kA 8/20 µs
Maximum Surge Current [I_{max}] per IEC 61643-11		60 kA 8/20 µs
Maximum Impulse (Lightning) Current [I_{imp}] per IEC 61643-11		5 kA 10/350 µs
Maximum Continuous Operating DC Voltage [U_c] (MCOV)		75 VDC
Voltage Protection Level [U_p] per IEC 61643-11		300 V
Voltage Protection Rating (VPR)		700 V
Suppression Technology		MOV
Strikesorb Module Type 2CA (UL 1449 4th edition)		30-V1-HV
Protection Modes:	Normal Mode	-48V to Return
	Common Mode	Return to Ground

Mechanical		
Connection Terminal (Alarm) Method		Form C Hardwired, #22 to #12 AWG [0.34 to 4 mm²]
Connection Terminal (Suppression) Method		Compression lug 2 hole, #10, 5/8 pitch, 12-4 AWG [3.31-21 mm²]
Cold Temperature Cycling IEC 61300-2-22		-30° C to +60° C 200 hrs @5 PSI
Resistance to Aggressive Materials CEI IEC 61073-2		Including Acids and Bases
UV Protection ISO 4892-2 Method A		Xenon-Arc 2160 hrs
Enclosure Type		Outdoor - NEMA 4 Rated
Enclosure Dimensions (L x W x H)		13.22" x 6.27" x 11.64" [336 x 159 x 296 mm]
Weight		16.0 lbs [7.26 kg]
Combined Wind Loading	Sustained	150 mph Sustained: 80.0 lbs [356 N]
	Gust	195 mph Gust: 135.0 lbs [601 N]

Standards Compliance & Certifications

Strikesorb modules are compliant to the following Surge Protection Device Standards:

Standards:	UL 1449 4th Edition: 2011, IEC 61643-11: 2011, EN 61643-11: 2012, IEEE C62.11: 2005, IEEE C62.41: 2002, IEEE C62.45: 2002, NEMA-LS-1
Certifications:	UL, VDE, CE

AWG=American Wire Gauge

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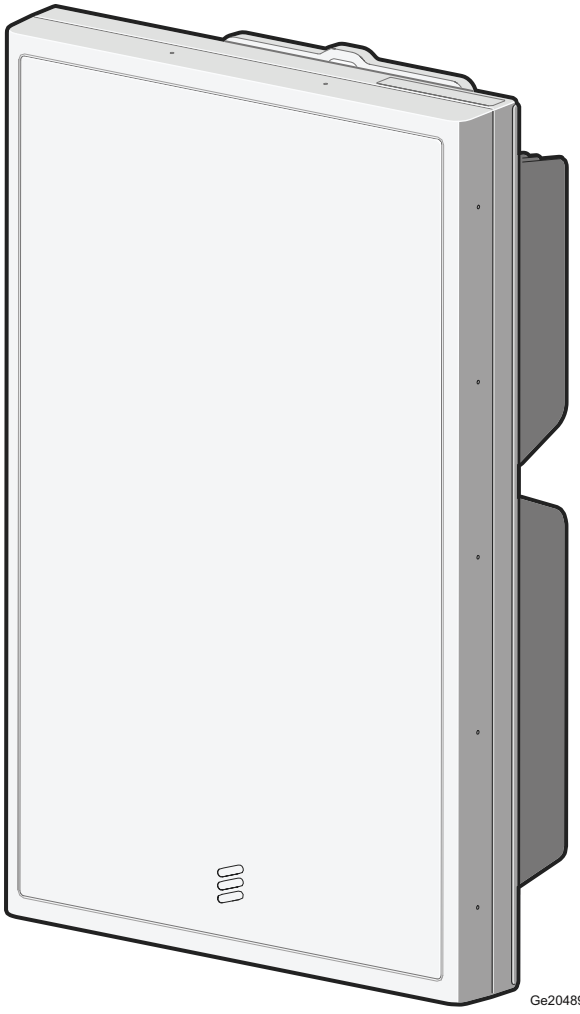
ERICSSON

Antenna Integrated Radio Unit Description

AIR 6449

Description



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Contents

1 Introduction

This document describes the AIR 6449 unit.

1.1 Warranty Seal

The product is equipped with a warranty seal sticker.

Note: Seals that have been implemented by Ericsson must not be broken or removed, as it otherwise voids warranty.

2 Product Overview

AIR 6449 is a 64TR TDD AAS for LTE and NR, operating as single standard or as mixed mode.

The AIR unit has beamforming and MU-MIMO technology, capable to fully utilize radio resources in both azimuth and elevation.

The main benefits compared to previous macro solutions are improvements in:

— Enhanced coverage - High gain adaptive beamforming

— Enhanced capacity - High-order spatial multiplexing and multi-user MIMO

— Advanced RAN features - Vertical and horizontal beamforming

— Improved network performance - Low inter-cell interference

The AIR unit is designed for outdoor installations, intended for pole, wall, tower, or mast mounting.

HWACs are required for this product.

A typical installation alternative is shown in Figure 1.

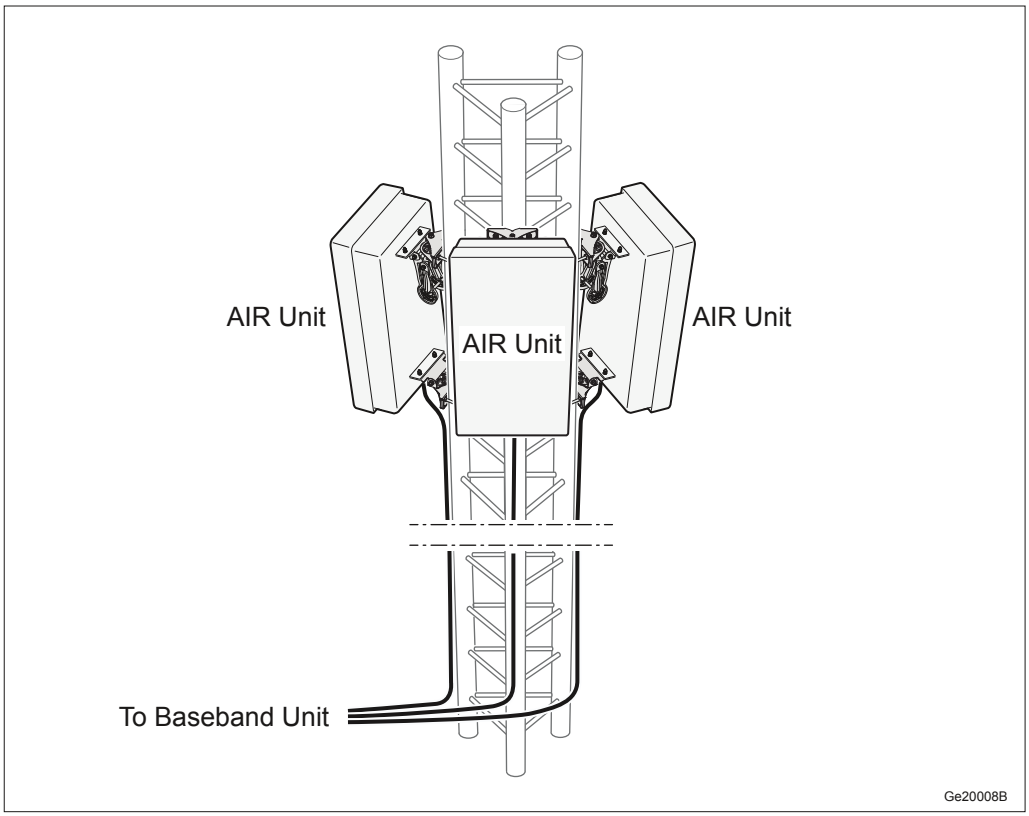


Figure 1 Three AIR Units Pointing in Three Different Directions

2.1 Main Features

- DC-I (3-wire) or DC-C (2-wire) power connection.
- LTE TDD, NR TDD, and multistandard mixed mode LTE + NR
- 64 transmitter/receiver (64TX/64RX) branches
- Up to 25.8 Gbps eCPRI
- Complies with 3GPP base station class Wide Area. For a list of relevant standards, see Radio Standards Compliance on page 39.

2.2 Required Installation Equipment

Table 1 Mounting Kit

Mounting Kit	Product Name	Product Number
Swivel mounting kit	AIR Medium, wall and pole mount bracket no tilt with azimuth	SXK 109 2064/1
Tilt and swivel mounting kit	AIR Medium, wall and pole mount bracket with tilt and azimuth	SXK 109 2065/1

For more information, see Site Installation Products Overview.

3 Technical Data

Table 2 Technical Data

Description	Value
Maximum nominal output power[1] [2][3]	B41, B41K, B42, B77D: 320 W B43: 280 W B78M: 240 W (License key is required for total output power over 20 W.)
Number of carriers	LTE[4]: Up to three for B41K, B42, B43, and B78M; up to four for B41; NR: Up to two for all bands Mixed mode: Up to six for B41 and B41K; up to four for B42, B43, and B78M
Frequency[5]	B41 for NR and LTE[6] 2496–2690 MHz
	B41K for NR and LTE[6] 2515–2675 MHz
	B42 for NR and LTE 3400–3600 MHz
	B43 for NR and LTE 3600–3800 MHz
	B77D for NR 3700–3980 MHz
	B78M for NR and LTE — B42H for LTE (single and mixed mode) 3450–3600 MHz — B43B for LTE (single and mixed mode) 3600–3650 MHz — B78M for NR (single and mixed mode) 3450–3650 MHz

(1) For detailed information about licenses and HWAC, see:

NR: Manage Licenses and Hardware Activation Codes in the NR RAN library.

LTE: Manage Licenses and Hardware Activation Codes in the LTE RAN library.

(2) For detailed information about output power, see:

NR: Hardware-Related Capabilities in the NR RAN library.

LTE: Hardware-Related Capabilities in the LTE RAN library.

(3) Minimum configured output power where performance is guaranteed is 20W.

(4) LTE in mixed mode only for B41 and B41K, in both single and mixed mode for B42, B43, and B78M

(5) For information about IBW, see Radio Node Configurations.

(6) LTE in mixed mode only.

3.1 EIRP Data

3.1.1 Traffic Beams

This section describes the EIRP of traffic beams for the AIR unit.

Table 3 AIR Unit Typical EIRP Performance Data for Traffic Beams

Unit	Uniform Traffic Beams(1)	Direction		
	Parameter	H0V6 deg	H55V6 deg	H0V18 deg
AIR 6449 B41 AIR 6449 B41K	Vertical Beamwidth	7°	7°	7.5°
	Horizontal Beamwidth	12.5°	21°	13°
	Peak EIRP (Typical)(2)(3)	2 × 75 dBm	2 × 70 dBm	2 × 72.5 dBm
AIR 6449 B43	Vertical Beamwidth	6°	6°	6°
	Horizontal Beamwidth	12°	19°	12°
	Peak EIRP (Typical)(2)(3)	2 × 77 dBm	2 × 73 dBm	2 × 74 dBm
AIR 6449 B77D	Vertical Beamwidth	6°	5.5°	6°
	Horizontal Beamwidth	11°	18.5°	12°

Unit	Uniform Traffic Beams(1)	Direction		
	Parameter	H0V6 deg	H55V6 deg	H0V18 deg
	Peak EIRP (Typical)(2)(3)	2 × 78 dBm	2 × 73 dBm	2 × 74.5 dBm

Unit	Uniform Traffic Beams(1)	Direction		
	Parameter	H0V6 deg	H55V6 deg	H0V19 deg
AIR 6449 B42	Vertical Beamwidth	6°	6°	6°
	Horizontal Beamwidth	12.5°	20°	13°
	Peak EIRP (Typical)(4)(5)	2 × 77 dBm	2 × 74 dBm	2 × 74 dBm
AIR 6449 B78M	Vertical Beamwidth	6°	6°	6°
	Horizontal Beamwidth	12°	20°	13°
	Peak EIRP (Typical)(4)(5)	2 × 76 dBm	2 × 73 dBm	2 × 73 dBm

(1) The traffic beamforming of this product is not limited to the uniform beamshapes and directions given in the table. The beams are dynamically optimized.

(2) The peak EIRP (typical) in the table is calculated for two simultaneous orthogonal beams.

(3) This value can be limited by the activation of certain features.

(4) The peak EIRP (typical) in the table is calculated for two simultaneous orthogonal beams.

(5) This value can be limited by the activation of certain features.

3.1.2 Broadcast Beams

This section describes performance data for broadcast beams in three different scenarios.

Table 4 AIR Unit Typical Antenna Performance Data for Broadcast Beams in Macro Scenario

Unit	Scenario: Macro	Beam LTE	Beam NR
	Parameter	BrM1(1), BrM2(2)	BrM1(1)
AIR 6449 B41 AIR 6449 B41K	Vertical Beamwidth	7.5±1°	7.5±1°
	Horizontal Beamwidth	65±5°	65±5°
	Digital Downtilt	−3° to 11°	−3° to 11°

Unit	Scenario: Macro	Beam LTE	Beam NR
	Parameter	BrM1(1), BrM2(2)	BrM1(1)
	Vertical Beam Pointing Error	≤ 1°	≤ 1°
	Horizontal Beam Pointing Direction	0±5°	0±5°
	EIRP (Typical)	2 × 67 dBm	1 × 70 dBm
	Vertical Side Lobe Suppression	15 dB	15 dB
	Front to Back Ratio	25 dB	25 dB
	Beam Parallelity	≤ −10 dB	N/A
AIR 6449 B42	Vertical Beamwidth	6±1°	6±1°
	Horizontal Beamwidth	65±5°	65±5°
	Digital Downtilt	−3° to 11°	−3° to 11°
	Vertical Beam Pointing Error	≤ 1°	≤ 1°
	Horizontal Beam Pointing Direction	0±5°	0±5°
	EIRP (Typical)	2 × 70 dBm	1 × 73 dBm
	Vertical Side Lobe Suppression	15 dB	15 dB
	Front to Back Ratio	25 dB	25 dB
	Beam Parallelity	≤ −10 dB	N/A
AIR 6449 B43	Vertical Beamwidth	6±1°	6±1°
	Horizontal Beamwidth	65±5°	65±5°
	Digital Downtilt	−3° to 11°	−3° to 11°
	Vertical Beam Pointing Error	≤ 1°	≤ 1°
	Horizontal Beam Pointing Direction	0±5°	0±5°
	EIRP (Typical)	2 × 70 dBm	1 × 73 dBm
	Vertical Side Lobe Suppression	15 dB	15 dB

Unit	Scenario: Macro	Beam LTE	Beam NR
	Parameter	BrM1(1), BrM2(2)	BrM1(1)
	Front to Back Ratio	25 dB	25 dB
	Beam Parallelity	≤ −10 dB	N/A
AIR 6449 B77D	Vertical Beamwidth	–	6±1°
	Horizontal Beamwidth	–	65±5°
	Digital Downtilt	–	−3° to 11°
	Vertical Beam Pointing Error	–	≤ 1°
	Horizontal Beam Pointing Direction	–	0±5°
	EIRP (Typical)	–	1 × 73.5 dBm
	Vertical Side Lobe Suppression	–	16 dB
	Front to Back Ratio	–	25 dB
	Beam Parallelity	–	N/A
AIR 6449 B78M	Vertical Beamwidth	6±1°	6±1°
	Horizontal Beamwidth	65±5°	65±5°
	Digital Downtilt	−3° to 11°	−3° to 11°
	Vertical Beam Pointing Error	≤ 1°	≤ 1°
	Horizontal Beam Pointing Direction	0±5°	0±5°
	EIRP (Typical)	2 × 69 dBm	1 × 72 dBm
	Vertical Side Lobe Suppression	15 dB	15 dB
	Front to Back Ratio	25 dB	25 dB
	Beam Parallelity	≤ −10 dB	N/A

(1) Broadcast Beam Macro 1

(2) Broadcast Beam Macro 2

Table 5 AIR Unit Typical Antenna Performance Data for Broadcast Beams in Hotspot Scenario

Unit	Scenario: Hotspot	Beam LTE	Beam NR
	Parameter	BrHS1(1), BrHS2(2)	BrHS1(1)
AIR 6449 B41 AIR 6449 B41K	Vertical Beamwidth	30±3°	30±3°
	Horizontal Beamwidth	65±5°	65±5°
	Digital Downtilt	Fixed 6°	Fixed 6°
	Vertical Beam Pointing Error	≤ 3°	≤ 3°
	Horizontal Beam Pointing Direction	0±5°	0±5°
	EIRP (Typical)	2 × 61.5 dBm	1 × 64.5 dBm
	Vertical Side Lobe Suppression	12 dB	12 dB
	Front to Back Ratio	–	–
	Beam Parallelity	≤ −10 dB	N/A
AIR 6449 B42	Vertical Beamwidth	25±3°	25±3°
	Horizontal Beamwidth	65±5°	65±5°
	Digital Downtilt	Fixed 6°	Fixed 6°
	Vertical Beam Pointing Error	≤ 1°	≤ 1°
	Horizontal Beam Pointing Direction	0±5°	0±5°
	EIRP (Typical)	2 × 64 dBm	1 × 67 dBm
	Vertical Side Lobe Suppression	11 dB	11 dB
	Front to Back Ratio	–	–
	Beam Parallelity	≤ −10 dB	N/A
AIR 6449 B43	Vertical Beamwidth	25±3°	25±3°
	Horizontal Beamwidth	65±5°	65±5°
	Digital Downtilt	Fixed 6°	Fixed 6°

Unit	Scenario: Hotspot	Beam LTE	Beam NR
	Parameter	BrHS1[1], BrHS2[2]	BrHS1[1]
	Vertical Beam Pointing Error	≤ 2°	≤ 2°
	Horizontal Beam Pointing Direction	0±5°	0±5°
	EIRP (Typical)	2 × 64 dBm	1 × 67 dBm
	Vertical Side Lobe Suppression	11 dB	11 dB
	Front to Back Ratio	–	–
	Beam Parallelity	≤ −10 dB	N/A
AIR 6449 B77D	Vertical Beamwidth	–	25±3°
	Horizontal Beamwidth	–	65±5°
	Digital Downtilt	–	Fixed 6°
	Vertical Beam Pointing Error	–	≤ 2°
	Horizontal Beam Pointing Direction	–	0±5°
	EIRP (Typical)	–	1 × 68 dBm
	Vertical Side Lobe Suppression	–	11 dB
	Front to Back Ratio	–	–
	Beam Parallelity	–	N/A
AIR 6449 B78M	Vertical Beamwidth	25±3°	25±3°
	Horizontal Beamwidth	65±5°	65±5°
	Digital Downtilt	Fixed 6°	Fixed 6°
	Vertical Beam Pointing Error	≤ 1°	≤ 1°
	Horizontal Beam Pointing Direction	0±5°	0±5°
	EIRP (Typical)	2 × 63.5 dBm	1 × 66.5 dBm
	Vertical Side Lobe Suppression	11 dB	11 dB

Unit	Scenario: Hotspot	Beam LTE	Beam NR
	Parameter	BrHS1(1), BrHS2(2)	BrHS1(1)
	Front to Back Ratio	–	–
	Beam Parallelity	≤ −10 dB	N/A

(1) Broadcast Beam Hotspot 1

(2) Broadcast Beam Hotspot 2

Table 6 AIR Unit Typical Antenna Performance Data for Broadcast Beams in Highrise Scenario

Unit	Scenario: Highrise	Beam LTE	Beam NR
	Parameter	BrHR1(1), BrHR2(2)	BrHR1(1)
AIR 6449 B41 AIR 6449 B41K	Vertical Beamwidth	30±3°	30±3°
	Horizontal Beamwidth	20±2°	20±2°
	Digital Downtilt	Fixed 6°	Fixed 6°
	Vertical Beam Pointing Error	≤ 1°	≤ 1°
	Horizontal Beam Pointing Direction	0±5°	0±5°
	EIRP (Typical)	2 × 66 dBm	1 × 69 dBm
	Vertical Side Lobe Suppression	12 dB	12 dB
	Front to Back Ratio	–	–
	Beam Parallelity	≤ −10 dB	N/A
AIR 6449 B42	Vertical Beamwidth	25±3°	25±3°
	Horizontal Beamwidth	20±2°	20±2°
	Digital Downtilt	Fixed 6°	Fixed 6°
	Vertical Beam Pointing Error	≤ 1°	≤ 1°
	Horizontal Beam Pointing Direction	0±1°	0±1°
	EIRP (Typical)	2 × 68 dBm	1 × 72 dBm
	Vertical Side Lobe Suppression	11 dB	11 dB

Unit	Scenario: Highrise	Beam LTE	Beam NR
	Parameter	BrHR1(1), BrHR2(2)	BrHR1(1)
	Front to Back Ratio	–	–
	Beam Parallelity	≤ −10 dB	N/A
AIR 6449 B43	Vertical Beamwidth	25±3°	25±3°
	Horizontal Beamwidth	20±2°	20±2°
	Digital Downtilt	Fixed 6°	Fixed 6°
	Vertical Beam Pointing Error	≤ 2°	≤ 2°
	Horizontal Beam Pointing Direction	0±2°	0±2°
	EIRP (Typical)	2 × 67 dBm	1 × 72 dBm
	Vertical Side Lobe Suppression	11 dB	11 dB
	Front to Back Ratio	–	–
	Beam Parallelity	≤ −10 dB	N/A
AIR 6449 B77D	Vertical Beamwidth	–	25±3°
	Horizontal Beamwidth	–	20±2°
	Digital Downtilt	–	Fixed 6°
	Vertical Beam Pointing Error	–	≤ 2°
	Horizontal Beam Pointing Direction	–	0±2°
	EIRP (Typical)	–	1 × 72 dBm
	Vertical Side Lobe Suppression	–	11 dB
	Front to Back Ratio	–	–
	Beam Parallelity	–	N/A
AIR 6449 B78M	Vertical Beamwidth	25±3°	25±3°
	Horizontal Beamwidth	20±2°	20±2°
	Digital Downtilt	Fixed 6°	Fixed 6°

Unit	Scenario: Highrise	Beam LTE	Beam NR
	Parameter	BrHR1(1), BrHR2(2)	BrHR1(1)
	Vertical Beam Pointing Error	≤ 1°	≤ 1°
	Horizontal Beam Pointing Direction	0±1°	0±1°
	EIRP (Typical)	2 × 66.5 dBm	1 × 71 dBm
	Vertical Side Lobe Suppression	11 dB	11 dB
	Front to Back Ratio	–	–
	Beam Parallelity	≤ −10 dB	N/A

(1) Broadcast Beam Highrise 1

(2) Broadcast Beam Highrise 2

3.2 Physical Characteristics

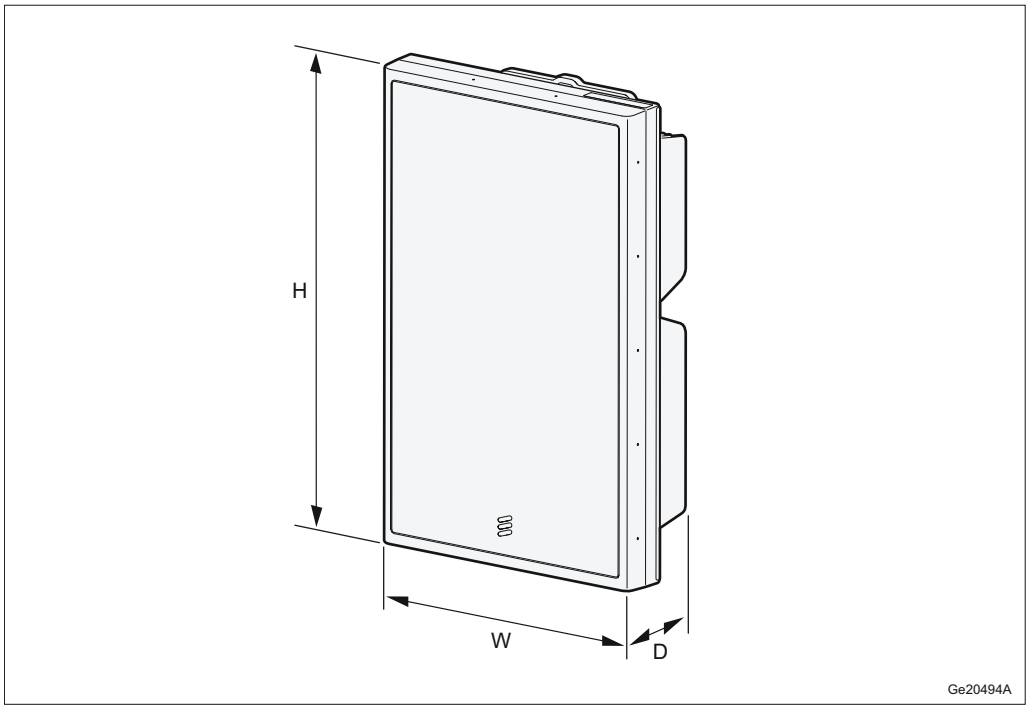


Figure 2 AIR Unit Dimensions

Table 7 AIR Unit Dimensions

AIR Unit Type	Height (H) × Width (W) × Depth (D)
AIR 6449 B41	841 × 521 × 217 mm
AIR 6449 B41K	841 × 521 × 217 mm
AIR 6449 B42	778 × 403 × 268 mm
AIR 6449 B43	778 × 403 × 268 mm
AIR 6449 B77D	778 × 403 × 268 mm
AIR 6449 B78M	778 × 403 × 268 mm

Table 8 AIR Unit Weight

AIR Unit Type	Unit Weight(1)	Mounting Kit Weight	
		SXK 109 2064/1	SXK 109 2065/1
AIR 6449 B41	46.1 kg	4.4 kg	5.9 kg
AIR 6449 B41K	45.7 kg	4.4 kg	5.9 kg
AIR 6449 B42	37.5 kg	4.4 kg	5.9 kg
AIR 6449 B43	37.5 kg	4.4 kg	5.9 kg
AIR 6449 B77D	38 kg	4.4 kg	5.9 kg
AIR 6449 B78M	37.5 kg	4.4 kg	5.9 kg

(1) The weight is given with ±5% accuracy.

The heat-sink of the AIR unit is gray (color code NCS S 4502-B) for B41, B41K, and B77D, and white (color code NCS S 1002-B) for B42, B43, and B78M .

The radome and covers of the AIR unit are white (color code NCS S 1002-B).

3.3 Installation Requirements

This section describes the installation requirements for installing the AIR unit. For a complete installation description, see Install Antenna Integrated Radio Units.

The AIR unit is designed for outdoor use, and it can be installed either on a pole, on a wall, on a mast, or on a tower.

Adhere to the following for safety and operation reasons: The mechanical design of the AIR unit is based on environmental conditions that are equal to or exceeding class 4.1 as specified in EN 300 019-1-4 and GR-3178-CORE and thereby respects the static mechanical load imposed on an AIR unit by wind at maximum velocity. Wind loads in this document are calculated with reference to wind pressure. For more accurate results, the specific terrain information for

relevant sites and geographical area where the AIR unit will be installed must be carefully analyzed, considered, and calculated according to EN 1991-1-4.

Pole clamps, brackets, mounting accessories and other installation material or equipment specified by Ericsson in the AIR unit product information documentation must be used and Ericsson installation instructions be complied with. In addition, it must be observed that specific environmental conditions that the AIR unit becomes exposed to, such as icing, heat, dust, dynamic stress (for example, strain caused by oscillating support structures) or other environmental conditions that exceed or otherwise deviate from the Environmental Characteristics on page 21, can result in the breakage of an AIR unit or its mounting accessories and even cause the AIR unit to fall to the ground.

These facts, information, and circumstances must be considered and properly taken into account during the site planning process and adhered to for installation and operation of the AIR unit. Ericsson expressly disclaims any responsibility or liability arising out of failures in this regard.

3.3.1 Outdoor Installation Environments to Avoid

The AIR unit is designed for outdoor use but to ensure optimal operation, avoid the following:

— Hot microclimates caused by, for example, heat radiated or reflected from dark or metallic walls or floors

— Chimney mouths or ventilation system outlets

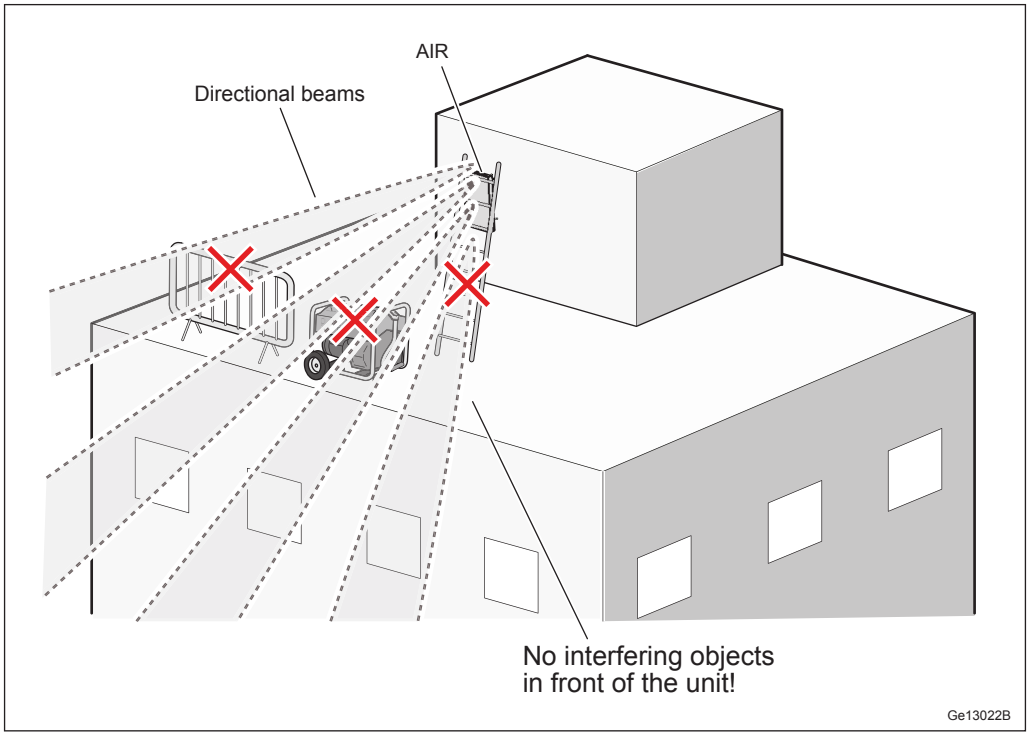
— Large glass or concrete surfaces

Avoid radio interference by keeping the area directly in front of the antenna clear of the following:

— Metal surfaces or objects such as railings, ladders, or chains

— Equipment generating electromagnetic fields, for example, electric motors in air conditioners or diesel generators

— RBS equipment



3.3.2 Painting Disclaimer

Ericsson recommends to not paint the product as it can affect performance of the product.

Ericsson applies limitations to the warranty and service contract if the product is painted.

If the product is painted, the following commercial limitations apply:

— Failure modes directly related to overheating because of painting are not valid for repair within the scope of the warranty or standard service contract.

— Product failures related to paint contamination of components of the unit are not valid for repair within the scope of warranty or standard service contract.

— When a painted unit is repaired, it might be restored to the standard color before being returned to the market. It is not possible to guarantee that the same unit is sent back to the same place. This is also valid for units repaired under a service contract.

— For repairs within the warranty period or a standard service contract, the customer is charged the additional costs for replacing all painted parts of the unit or the complete unit.

If adaptations are required, contact Ericsson for information.

3.4 Installation Alternatives

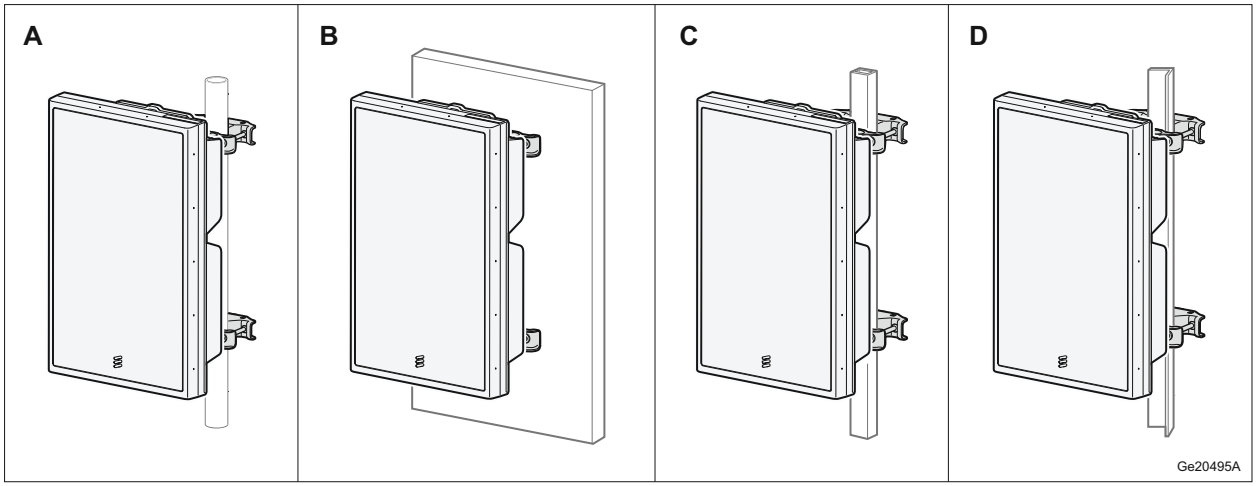


Figure 3 Installation Method Alternatives

Table 9 Installation Alternatives

Installation Method	Description
A	Pole installation (pole with circular cross section)
B	Wall installation
C	Pole installation (pole with square cross section)
D	Pole installation (pole with 90° angle cross section)

Table 10 Pole Mounting Range

Pole	Circular	Square	90° Angle
Minimum outer dimension	Ø76 mm	50 × 50 mm	50 × 50 mm
Maximum outer dimension	Ø114 mm	80 × 80 mm	80 × 80 mm

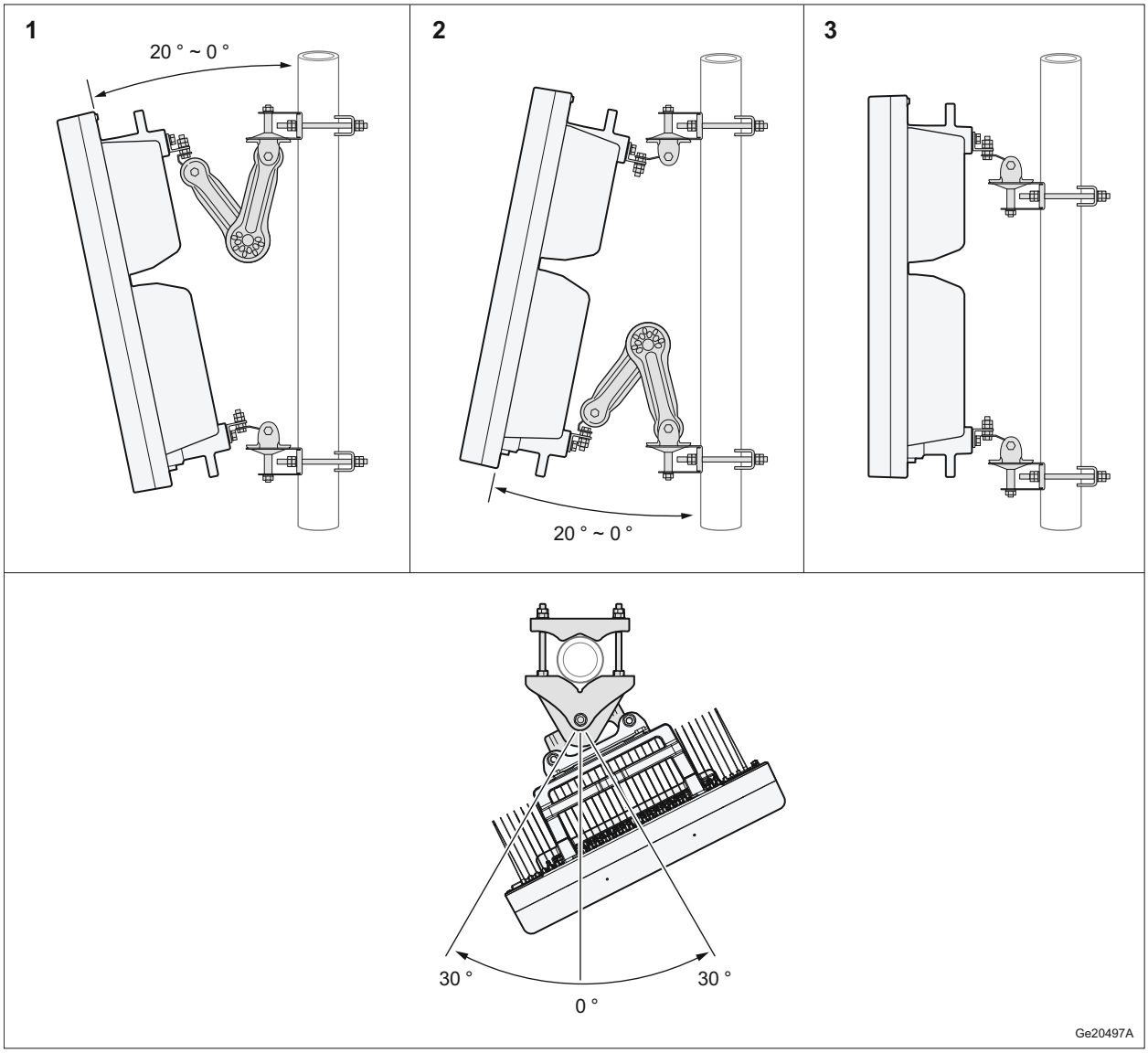


Figure 4 Tilt and Swivel Angle

Note: Mounting kit SXK 109 2064/1 supports swivel angle, and SXK 109 2065/1 supports both swivel and tilt angle.

3.5 Space Requirements

The AIR unit is installed with the cable connections facing down. Allow enough free space below the AIR unit to ensure sufficient working space.

Table 11 Space Requirements Between AIR Units or AIR Unit and Antenna Installed Side by Side

Required Free Horizontal Space
0.1 m

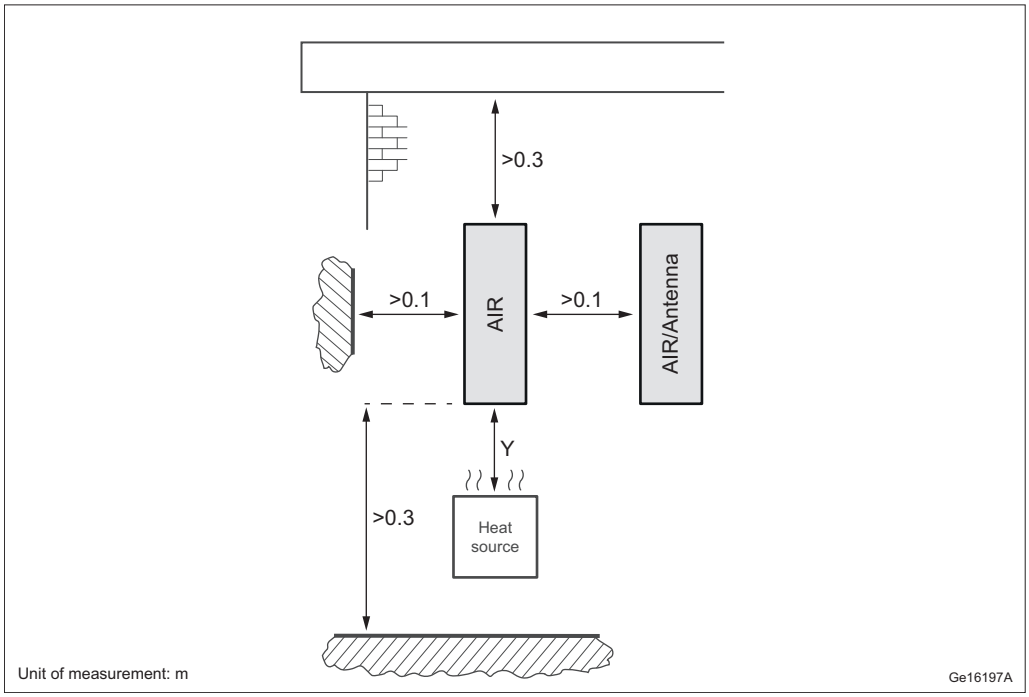


Figure 5 Space Requirements for AIR Unit

Distance Y depends on the heat dissipation from the source below the AIR as well as the surrounding temperature. The distance must be big enough so that the maximum operating temperature limit is not exceeded.

Table 12 Temperature Increase Due to Heat Source Below AIR at Different Distances [degrees Celsius]

Distance Y	Heat Dissipation from Source Below AIR			
	350 W	500 W	950 W	1200 W
0.2 m	1°C	3°C	5°C	6°C
0.3 m	0°C	1°C	3°C	4°C
0.5 m	0°C	0°C	2°C	3°C

Note: To ensure adequate airflow, do not enclose the AIR unit in a box-like environment.

3.6 Acoustic Noise

The AIR unit does not have active cooling components. It can emit low levels of acoustic noise when operating on low capacity.

The sound pressure level when operating on low capacity in NR is lower than 28 dBA at 1-meter distance and hemispherical distribution, and 25 dBA for spherical distribution.

3.7 Environmental Characteristics

This section contains operating environment data for the AIR unit.

3.7.1 Operating Environment

The following are the values for the normal operating environment of the AIR:

Temperature(1)	−40 to +55°C
Solar radiation	≤ 1,120 W/m²
Relative humidity	2% to 100%
Absolute humidity	0.26 to 40 g/m³
Maximum wind load at 42 m/s (Pole installed AIR unit)	B41: 639 N (front), 147 N (side)
	B41K: 639 N (front), 147 N (side)
	B42: 478 N (front), 172 N (side)
	B43: 478 N (front), 172 N (side)
	B77D: 478 N (front), 172 N (side)
	B78M: 478 N (front), 172 N (side)

(1) Depending on installation scenario, traffic load, and configuration, the product can, in the highest 10 °C temperature range, temporarily reduce the output power. This depends on the durations of the high ambient temperature.

3.7.2 Heat Dissipation

The AIR is convection cooled and designed for outdoor installation.

Table 13 AIR Heat Dissipation

Unit	Output Power (W)	Maximum Heat Dissipation (kW)
AIR 6449 B41	320	1.0
AIR 6449 B41K	320	1.0
AIR 6449 B42	320	1.0

Unit	Output Power (W)	Maximum Heat Dissipation (kW)
AIR 6449 B43	280	1.0
AIR 6449 B77D	320	1.0
AIR 6449 B78M	240	1.0

3.7.3 Vibration

This section describes how the AIR unit tolerates vibrations. The AIR unit operates reliably during seismic activity as specified by test method IEC 60068-2-57 Ff.

Maximum level of RRS	50 m/s^2 within 2–5 Hz for DR=2%
Frequency range	1–35 Hz
Time history signal	Verteq II from earthquake standard ATIS 0600329.2014

The AIR unit operates reliably during random vibration as specified by test method IEC 60068-2-64.

Random vibration, normal operation:

ASD-level	0.3 m^2/s^3 on horizontal axes X and Y
	0.2 m^2/s^3 on vertical axis Z
Frequency range	2–200 Hz
Time per test direction	30 minutes

3.7.4 Materials

All Ericsson products fulfill the legal, market, and Ericsson requirements regarding the following:

— Material declaration

— Materials' fire resistance, components, wires, and cables

— Recycling

— Restricted and banned material use

3.8 Power Supply Characteristics

This section describes the power supply requirements, power consumption, and circuit breaker recommendations for the AIR unit.

3.8.1 DC Power Supply Characteristics

The AIR unit is designed for DC-I (3-wire) power connections used on DC-I (3-wire) sites. For DC-C (2-wire) power solutions, a DC-C (2-wire) connector is used.

The following is a list of the power supply requirements:

Nominal Voltage	−48 V DC
Operating Voltage Range	−36.0 to −58.5 V DC
Non-destructive Range	0 to −60 V DC

Circuit Breaker Specifications

The specifications given in this section are based on the peak power consumption, and they give no information on power consumption during normal operation.

The protection device must be a circuit breaker with short time-delay tripping characteristics, according to the curve shown in Figure 6. The compliant circuit breakers include, but are not limited to, AIRPAX Delay Curve 51, Heinemann Curve 3, and Nader Curve Z2.

The other characteristics of the circuit breaker must be according to IEC 60947-2, UL 489A, or both.

The circuit breaker must be compliant with the local regulations.

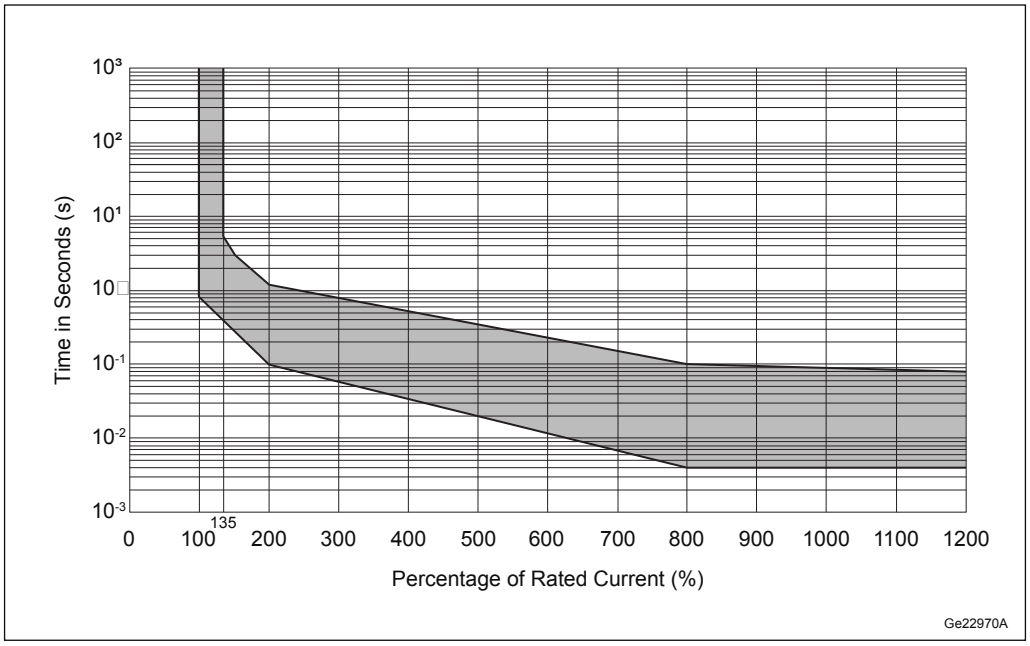


Figure 6 DC Circuit Breaker Tripping Curve

Table 14 AIR Unit Circuit Breaker Specifications

Unit (DC Powered)	Output Power	Maximum Load Current	Maximum Allowed Circuit Breaker Rating(1)
AIR 6449 B41	320 W	45 A	50 A
AIR 6449 B41K	320 W	45 A	50 A
AIR 6449 B42	320 W	40 A	50 A
AIR 6449 B43	280 W	39 A	50 A
AIR 6449 B77D	320 W	43 A	50 A
AIR 6449 B78M	240 W	34 A	45 A

(1) The maximum allowed circuit breaker rating must (with a certain safety margin 10-20%) be larger than the maximum load current for reliable operation. However, it must not be larger than the next or nearest higher circuit breaker standard value in order to minimize the cable cross-section area and at the same time fully comply with relevant safety standards.

3.8.2 Power Consumption

For information on power consumption, see Power Consumption Calculations.

3.9 System Characteristics

This section describes the system characteristics of the AIR.

3.9.1 RF Electromagnetic Field Exposure

For general information on RF EMF exposure, see Radio Frequency Electromagnetic Fields.

The following tables list the compliance boundaries (exclusion zones), outside of which the RF EMF exposure from AIR 6449 is below the limits specified by the ICNIRP, and the limits applicable in:

— EU (1999/519/EC, 2013/35/EU, EN 50385) Table 15

— USA (47 CFR 1.1310) Table 16

— Canada (Health Canada Safety Code 6) Table 17

Information is provided for the theoretical maximum exposure condition and (for some bands) for the actual maximum exposure condition (see IEC 62232). The theoretical maximum exposure condition does not consider how the time-averaged power is distributed within the scan range of the product and is very conservative. The actual maximum exposure condition takes into account the effects of beam scanning on the time-averaged power that contributes to the RF exposure. A PRF of 0.32 was used to represent realistic deployment scenarios (see IEC TR 62669).

Note: National regulations can prescribe requirements on the use of actual maximum exposure conditions for RF EMF compliance assessments.

Table 15 Dimensions of the Box-Shaped Compliance Boundary for General Public (GP) and Occupational (O) Exposure Applicable in the EU and Markets Employing the ICNIRP RF Exposure Limits

Mode and Output Power for AIR 6449							Dimensions of the Box-Shaped Compliance Boundary[1][2] (m)							
							Distance in Front of AIR		Width		Height		Distance Behind AIR	
Band	Standard	Maximum Nominal Output Power from the AIR	IEC 62232 Installation Class	Power Tolerance	TDD DL Duty Cycle	Exposure Condition	GP	O	GP	O	GP	O	GP	O
B41K	NR	320 W	E+	1.0 dB	75%	Theoretical Maximum	25.9	11.6	31.2	14.0	13.5	6.1	0	0
						Actual Maximum (PRF = 0.32)	14.7	6.6	17.7	7.9	7.6	3.4	0	0
B41K	LTE	320 W	E+	1.0 dB	75%	Theoretical Maximum	23.2	10.4	27.3	12.2	12.0	5.4	0	0
						Actual Maximum (PRF = 0.32)	14.0	6.3	15.8	7.1	7.1	3.2	0	0
B42	NR[3]	320 W	E+	1.0 dB	75%	Theoretical Maximum	28.5	12.8	33.7	15.1	12.6	5.7	0	0
						Actual Maximum (PRF = 0.32)	16.1	7.2	19.1	8.6	7.2	3.2	0	0
B42	LTE[3]	320 W	E+	1.0 dB	75%	Theoretical Maximum	25.5	11.4	29.6	13.3	11.4	5.1	0	0
						Actual Maximum (PRF = 0.32)	15.4	6.9	17.2	7.7	6.8	3.1	0	0
B43	NR[3]	280 W	E+	1.5 dB	75%	Theoretical Maximum	29.5	13.2	33.4	15.0	12.9	5.8	0	0
						Actual Maximum (PRF = 0.32)	16.7	7.5	18.9	8.5	7.3	3.3	0	0
B43	LTE[3]	280 W	E+	1.5 dB	75%	Theoretical Maximum	26.4	11.8	29.3	13.1	11.4	5.1	0	0

Mode and Output Power for AIR 6449							Dimensions of the Box-Shaped Compliance Boundary[1][2] (m)							
							Distance in Front of AIR		Width		Height		Distance Behind AIR	
Band	Standard	Maximum Nominal Output Power from the AIR	IEC 62232 Installation Class	Power Tolerance	TDD DL Duty Cycle	Exposure Condition	GP	O	GP	O	GP	O	GP	O
						Actual Maximum (PRF = 0.32)	15.9	7.2	17.0	7.6	6.8	3.1	0	0
B78M	NR[3]	240 W	E+	1.0 dB	75%	Theoretical Maximum	25.5	11.4	30.0	13.4	11.4	5.1	0	0
						Actual Maximum (PRF = 0.32)	14.4	6.5	17.0	7.6	6.5	2.9	0	0
B78M	LTE[3]	240 W	E+	1.0 dB	75%	Theoretical Maximum	22.8	10.2	26.3	11.8	10.1	4.6	0	0
						Actual Maximum (PRF = 0.32)	13.8	6.2	15.2	6.8	6.0	2.7	0	0

(1) The compliance boundaries are determined for maximum output power with power tolerance and TDD downlink duty cycle included, and for theoretical maximum and actual maximum exposure conditions.

(2) For LTE, the compliance boundaries are determined for 75% of the power allocated to traffic beams and 25% to the broadcast beam. For actual maximum power conditions, the PRF of 0.32 was applied only to the power fraction allocated to traffic beams.

(3) For NR+LTE mixed mode, the results for NR apply.

Table 16 Dimensions of the Box-Shaped Compliance Boundary for General Public (GP) and Occupational (O) Exposure Applicable in Markets Employing the FCC Exposure Limits

Mode and Output Power for AIR 6449						Dimensions of the Box-Shaped Compliance Boundary[1][2] (m)							
						Distance in Front of AIR		Width		Height		Distance Behind AIR	
Band	Standard	Maximum Nominal Output Power from the AIR	IEC 62232 Installation Class	Power Tolerance	TDD DL Duty Cycle	GP	O	GP	O	GP	O	GP	O
B41	NR	320 W	E+	1 dB	75%	26.8	12.0	31.9	14.3	13.8	6.2	0.2	0.2
B41	LTE	320 W	E+	1 dB	75%	24.0	10.8	27.9	12.5	12.2	5.5	0.2	0.2
B77D	NR	320 W	E+	1.5 dB	75%	31.2	14.0	35.3	15.8	13.4	6.0	0.2	0.2

(1) The compliance boundaries are determined for maximum output power with power tolerance and TDD downlink duty cycle included.

(2) For LTE, the compliance boundaries are determined for 75% of the power allocated to traffic beams and 25% to the broadcast beam.

Table 17 Dimensions of the Box-Shaped Compliance Boundary for General Public (GP) and Occupational (O) Exposure Applicable in Canada

Mode and Output Power for AIR 6449							Dimensions of the Box-Shaped Compliance Boundary[1][2] (m)							
							Distance in Front of AIR		Width		Height		Distance Behind AIR	
Band	Standard	Maximum Nominal Output Power from the AIR	IEC 62232 Installation Class	Power Tolerance	TDD DL Duty Cycle	Exposure Condition	GP	O	GP	O	GP	O	GP	O
B78M	NR[3]	240 W	E+	1.0 dB	75%	Theoretical maximum	30.8	13.1	36.2	15.4	13.8	5.9	0.2	0.2
						Actual Maximum (PRF = 0.32)	17.4	7.4	20.5	8.7	7.8	3.4	0.2	0.2
B78M	LTE[3]	240 W	E+	1.0 dB	75%	Theoretical maximum	27.6	11.7	31.7	13.5	12.2	5.2	0.2	0.2
						Actual Maximum (PRF = 0.32)	16.6	7.1	18.4	7.9	7.3	3.1	0.2	0.2

(1) The compliance boundaries are determined for maximum output power with power tolerance and TDD downlink duty cycle included, and for theoretical maximum and actual maximum exposure conditions.

(2) For LTE, the compliance boundaries are determined for 75% of the power allocated to traffic beams and 25% to the broadcast beam. For actual maximum power conditions, the PRF of 0.32 was applied only to the power fraction allocated to traffic beams.

(3) For NR+LTE mixed mode, the results for NR apply.

3.9.2 Software

For information on software dependencies, see Radio Software Support.

3.9.3 Radio Configurations

For information about available radio configurations, see Radio Node Configurations.

4 Hardware Architecture

This section describes the AIR unit hardware structure regardless of configuration or frequency. For a description of the currently available radio configurations, see Radio Node Configurations.

4.1 AIR Unit Parts

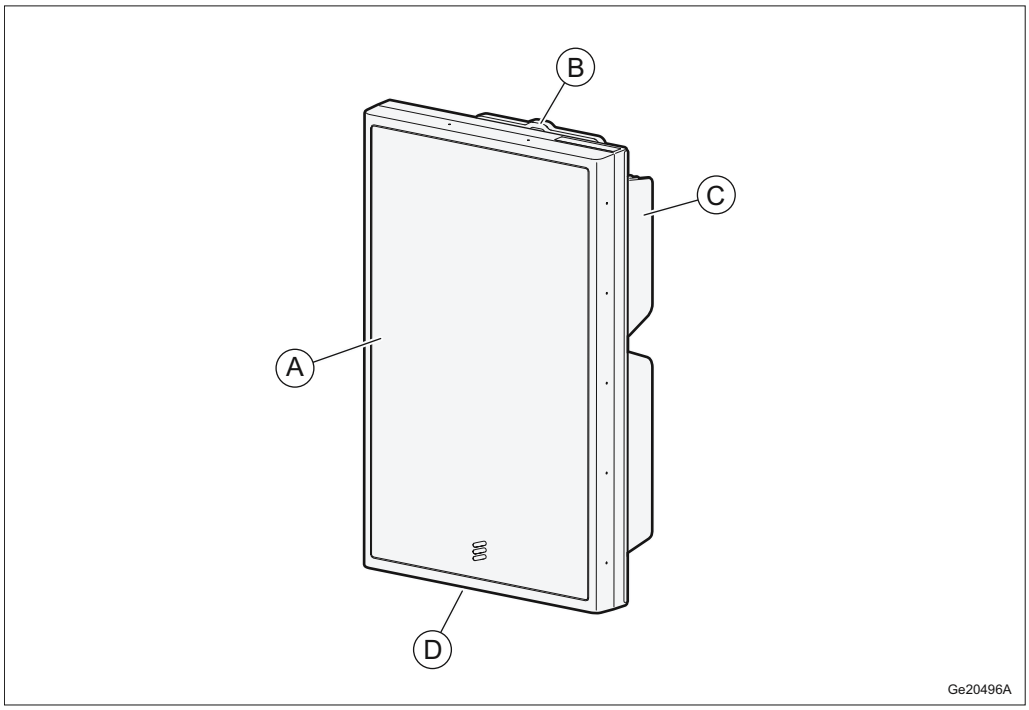


Figure 7 AIR Unit Parts

Table 18 AIR Unit Parts

Position	Component
A	Radome
B	Upper lifting eye
C	Cooling fins
D	Connection interfaces

4.2 Optical Indicators and Button

The AIR unit is equipped with optical indicators that show the system status.

For detailed information about the optical indicators, see Indicators, Buttons, and Switches.

Note: The AIR unit has no maintenance button.

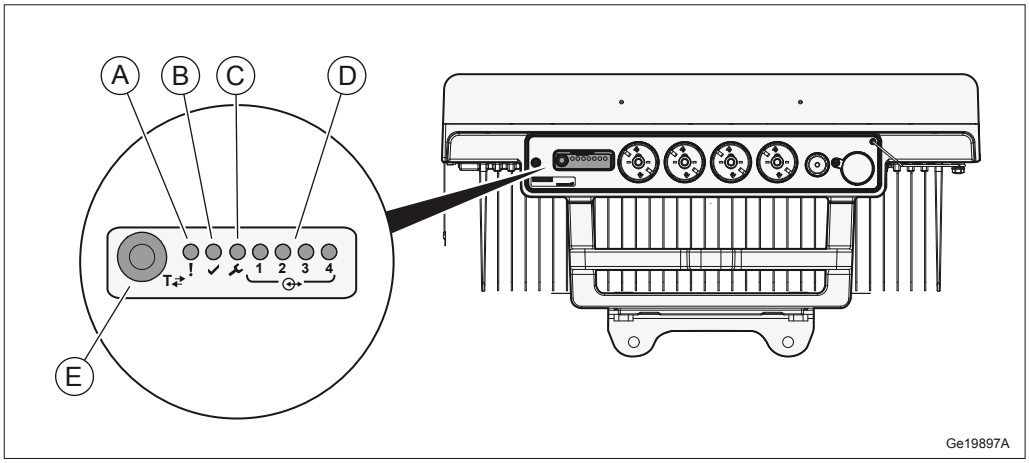


Figure 8 Optical Indicators and Button

Table 19 Optical Indicators

Position	Marking	Indicator	Color	Mode	Interpretation
A	!	Fault	red	Off	No fault detected in unit
				On	Fault detected in unit
B	✔	Operational	Green	Off	No power
				On	Operational
				Flashing Slowly (0.5 Hz)	Missing dependent resource
				Flickering (16 Hz)	Transitory activity
				Double flashing Off	Loading in progress No ongoing traffic

Position	Marking	Indicator	Color	Mode	Interpretation
				Double flashing On	Loading in progress Traffic is ongoing
C		Maintenance	Blue	Off	No ongoing maintenance activity Traffic is ongoing
				On	Maintenance mode All traffic and alarms are suppressed
				Flashing Slowly (0.5 Hz)	Maintenance mode is initiated When traffic and alarms are removed, the indicator switches to **On**
D	1, 2, 3, 4	Interface	Green	Off	Disconnected
				On	Connected

Table 20 Button

Position	Function	Marking
E	For future use	

5 Connection Interfaces

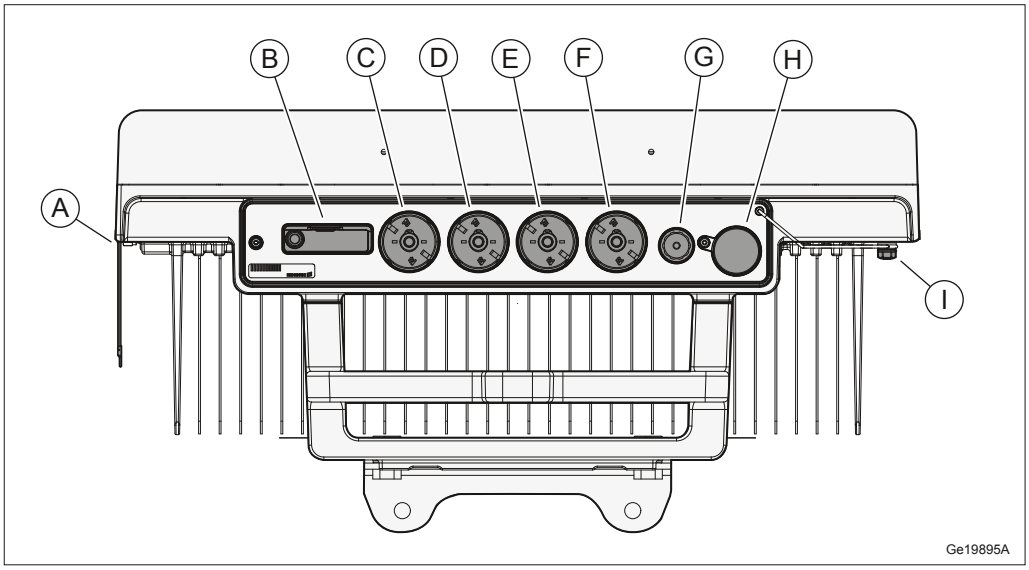
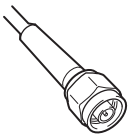
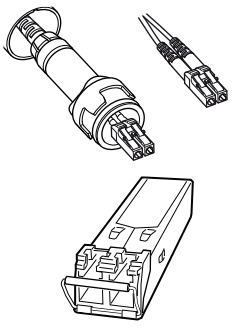
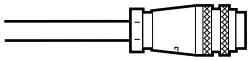
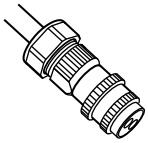


Figure 9 AIR 6449 Connection Interfaces

Table 21 AIR 6449 Connection Interfaces

Position	Description	Marking	Connector Types	Cable Illustration
A	TX Monitor		SMA female connector	
B	Optical indicators	! , , 1, 2, 3, 4	–	–
C(1)	eCPRI 1	1	LC (On SFP28) with support for FullAXS	
D(1)	eCPRI 2	2		
E(1)	eCPRI 3	3		
F(1)	eCPRI 4	4		

Position	Description	Marking	Connector Types	Cable Illustration
G	DIN 14 pin, following functions supported: — RAE — EC-light — External alarms **Note:** If using more than one function, a Y-cable must be connected to the DIN 14 connector for each added function.		DIN 14 female connector	
H	−48 V DC power supply	−48 V	Power connector	
I	Grounding point		2 × 6 mm dual lug	

(1) See AIR 6449 Connection to Baseband per RAT on page 32.

AIR 6449 Connection to Baseband per RAT

Figure 10 shows the early phase alternatives for connection to Baseband.

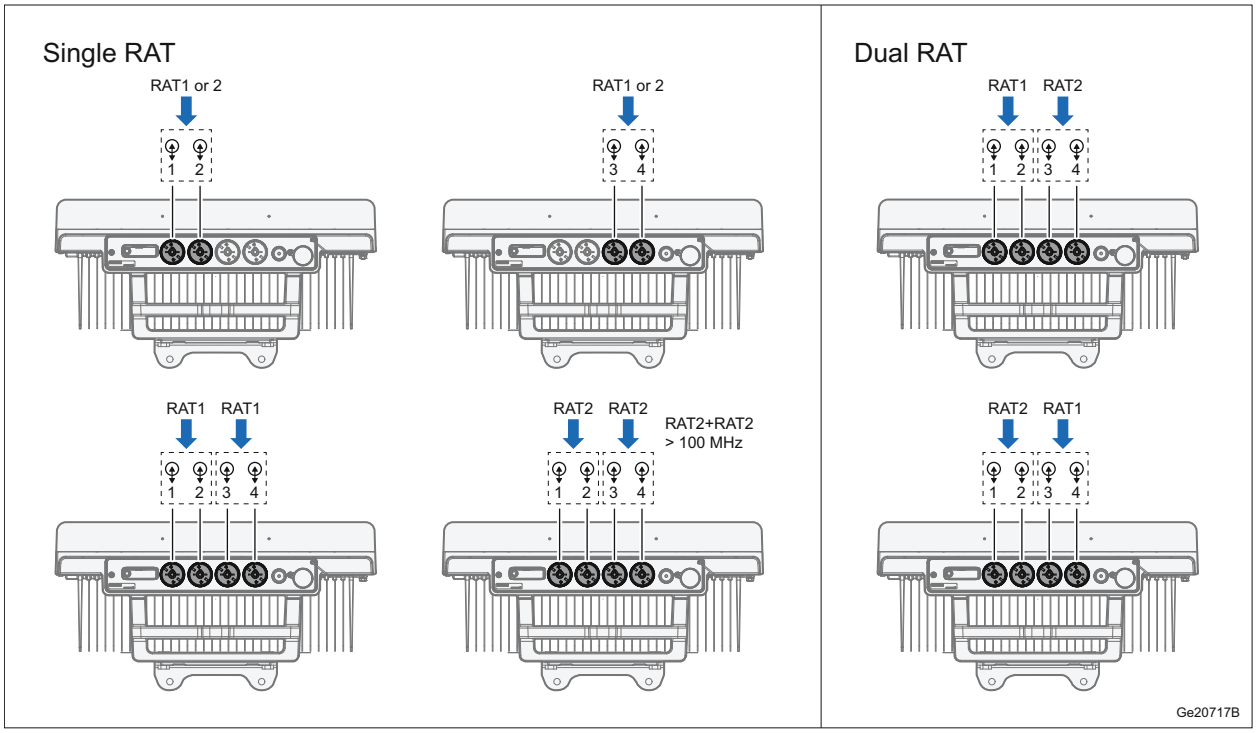


Figure 10 Connections to Baseband

The ports can be used for connection to Baseband in the following ways:

— Ports are grouped in pairs:
  - Data port 1 and 2 is a pair.
  - Data port 3 and 4 is a pair.

— Connection to LTE Baseband must be connected as a pair if two ports are used.

— Connection to NR Baseband must be connected as a pair if two ports are used.

— Mixed mode within a pair is not supported.

Each pair is limited to 100 MHz BW for the assigned carriers, using one or two ports.

5.1 Grounding Interface

The unit must be grounded to protect it from overvoltage and lightning strikes.

For more information about grounding principles, see Grounding Guidelines for RBS Sites.

5.2 −48 V DC Power Supply Interface

The −48 V DC power connection is made through a connector with a 3-wire (DC-I) connection or a connector with a 2-wire (DC-C) connection.

For power cable dimensioning, see Site Installation Products Overview.

For determining which connector or junction box to use, see Table 22.

Table 22 −48 V DC Power Supply Connector or Junction Box

Cross-Sectional Area of Each Conductor (mm^2)	Connector or Junction Box
10–16	Used with connector RNT 447 36/01 (3-wire (DC-I)) or RNT 447 37/01 (2-wire (DC-C))
25	Used with junction box NTB 101 75/1

The power cable conductor has a wire for both the 0 V conductor and a wire for the −48 V DC conductor.

All cables must be shielded. The shielding must be properly connected both to the power connector and to the grounding in the power supply equipment; otherwise, the AIR unit over voltage and lightning protection does not function properly.

5.3 Optical Cable Interface

The optical cable interfaces provide connections to optical cables for traffic and timing signals between the AIR and a Baseband unit. A Small Form-factor Plugable (SFP) is used to connect the optical cable to the AIR.

Note: The AIR uses SFP28 modules for optical transmission and optical radio interfaces on the data ports.

Use the same SFP type on both the AIR and Baseband.

Only use SFP28 modules approved and supplied by Ericsson. These modules fulfill the following:

— Compliance with Class 1 laser product safety requirements defined in standard IEC 60825-1.

— Certification according to general safety requirements defined in standard IEC 62368-1.

— Functional and performance verified to comply with RBS specifications.

Recommended SFP28 modules are obtained from the product packages for the RBS and the Main Remote Installation products. For more information, see Spare

Parts Catalog, Site Installation Products Overview, and SFP Module Selector Guide.

eCPRI Interface

The AIR unit sets up connection with Baseband via eCPRI interface, an Ethernet port up to 25.8 Gbps.

5.4 DIN 14 Pin Interface

The DIN 14 pin interface supports the following functions:

— EC-light

— External alarm

— RAE

5.4.1 EC-Light

The EC-light function delivers communication signals and alarms between the optional PSU and the AIR.

5.4.2 External Alarm

The external alarm function can be used to monitor alarms from sensors on external equipment, for example doors, diesel tanks, lights, and others.

5.4.3 RAE

Remote Antenna Extension (RAE) is used to determine if the AAS unit has moved during a thunder storm, earthquake, or similar.

The RAE unit is mounted on top of the AAS and measures four different properties:

— Position

— Antenna Azimuth

— Mechanical Tilt

— Antenna Mounting Height

For the measurements, except for altitude measurement, satellite positioning systems are used. It means that the unit is dependent of free line of sight to several satellites to be able to work.

5.5 Optical Indicators

Optical indicators show the system status. For more information about the optical indicators, see Indicators, Buttons, and Switches.

5.6 TX Monitor Interface

The TX monitor interface provides monitoring of output power and performance.

The TX monitor output is the sum of coupled signals from all 64 branches. Compared to the output signals the TX monitor signal is attenuated 20 dB to 53 dB depending on the number of active branches and the amplitude and phase relations between them.

If only one branch is active, the attenuation is 53 dB.

6 Standards and Regulations

This section presents a brief overview of standards, regulatory product approval, and declaration of conformity for the radio.

Declaration of Conformity

"Hereby, Ericsson AB, declares that this product is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU and 2011/65/EU."

FCC Compliance Statement

"This device complies with Part 15 of the FCC CFR 47 rules. Operation is subject to the following two conditions: This device may not cause harmful interference. This device must accept any interference received, including interference that may cause undesired operation."

6.1 Regulatory Approval

The product complies with the following market requirements:

— European Community (EC) market requirements, Radio Equipment Directive 2014/53/EU and Directive 2011/65/EU.

— The apparatus may include Radio Transceivers with support for frequency bands not allowed or not harmonized within the EC.

— Products containing radio Equipment outside North America and in countries not recognizing the CE-mark may be labeled according to national requirements or standards.

6.1.1 Environmental Standards Compliance

The product complies with the following environmental standard:

Europe

— Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive (2011/65/EU)

6.1.2 Safety Standards Compliance

In accordance with market requirements, the product complies with the following product safety standards and directives:

International

— IEC 62368-1

Europe

— EN 50385

— EN 62368-1

North America

— FCC CFR 47 Part 1.1310

— UL 62 368-1

— CSA-C22.2 No. 62 368-1

— Health Canada Safety Code 6

6.1.2.1 Outdoor Specific Requirements

The product complies with the following outdoor specific requirements:

International

— IEC 60529 (IP65)

— IEC 60950-22

Europe

— EN 60529 (IP65)

— EN 60950-22

North America

— UL 50E

— UL 60950-22

— CAN/CSA-C22.2 No. 60950-22

6.1.3 EMC Standards Compliance

The product complies with the following Electromagnetic Compatibility (EMC) standards:

International

— 3GPP TS37.114

— 3GPP TS38.113

Europe

— ETSI EN 301 489-1

— ETSI EN 301 489-50

North America

— FCC CFR 47 Part 15 B

— IC ICES-003 B

6.1.4 Radio Standards Compliance

The product complies with the following radio standards:

International

— 3GPP TS37.145-1

— 3GPP TS37.145-2

— 3GPP TS38.141-1

— 3GPP TS38.141-2

Europe

— ETSI EN 301 908-1

— ETSI EN 301 908-18

North America

— FCC CFR 47 Part 27

— FCC CFR 47 Part 2

— FCC CFR 47 Part 96

— IC RSS-Gen

— IC RSS-192

6.1.5 Marking

To show compliance with legal requirements, the product is marked with the following labels:

Europe

— CE mark

North America

— FCC CFR 47 Part 15 Statement

— IC ICES-003 Statement

— usETL/cETL

— FCC ID Number

— IC ID Number

6.2 Other Standards and Regulations

The standards and regulations in this section are not regulatory approved.

6.2.1 Spare Parts

The product adheres to the Ericsson Serviceability and Spare Part Strategy.

6.2.2 Surface Quality

The surface quality of the AIR unit is according to Ericsson standard class A5 for the radome, top, front, and side covers, and A6 for the heat-sink.

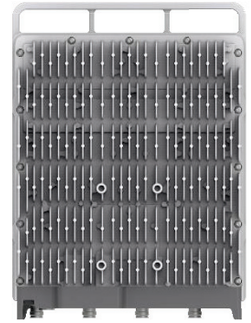
6.2.3 Vandal Resistance

Unauthorized access is not possible without damaging the tamper proof warranty seal.

RADIO 4449 DUAL BAND B5 & B12

Target PRA: 30 Oct 2018

- 4TX/4RX per Band (B5 & B12)
- 320W of total power
  - 4x40 W per band (4T4R in each band)
- Full IBW in each band
- Carrier BW:
  - 5, 10 MHz
- LTE: Max 6 carriers per port (DL), max 6 carriers per port (UL)
- CPRI Support:
  - 2.5; 4.9; 9.8; 10.1
- -48 VDC 3-wire (2-wire with adapter)
  - Two DC power ports of 20A
- AISG TMA & RET support via RS-485 or RF connectors
  - Bias-T only be supported on antenna port A and C.
- Four antenna connectors : 4 x 4.3-10 plus (f)
- 2 external alarm
- ~ 73 lb.
- ~33L (14.96” x 13.19” x 10.43”)
  (Preliminary, final figures in Mar 18 pending B12 filter design)
- IP 65, -40 to +55℃



RRUS 4478 B14 DATA SHEET

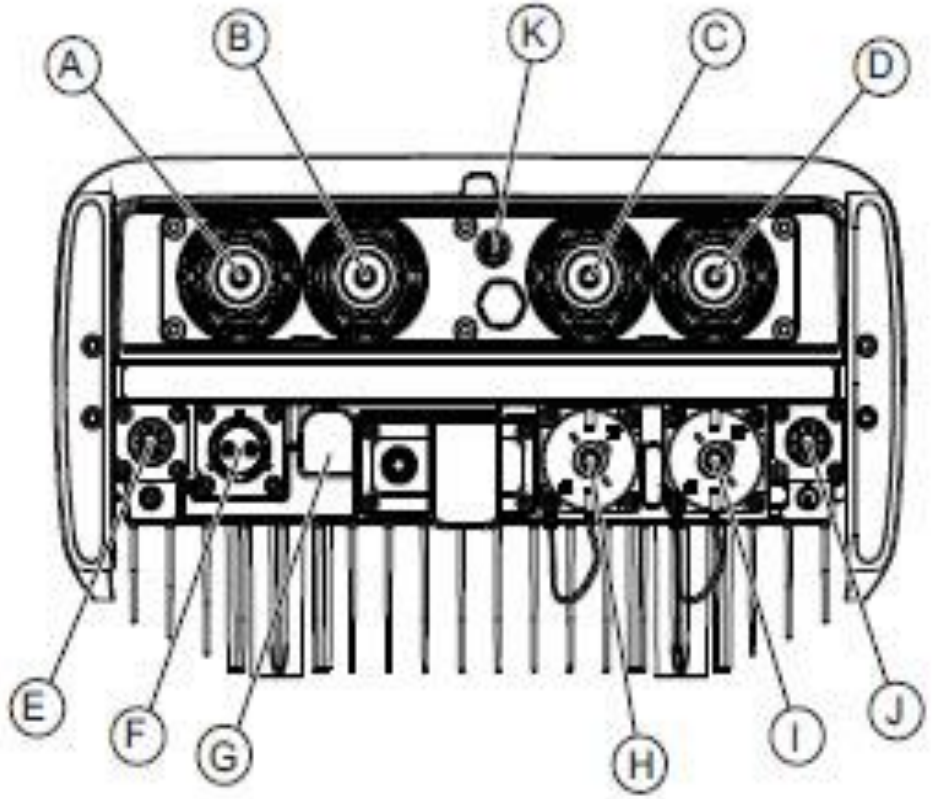
For Turf Vendors

2017-07-13 Rev D

RRUS 4478 B14

- B14
  - TX = 758 – 768 MHz
  - RX = 788 – 798 MHz
- CPRI 2 ports x 2.5/4.9/9.8/10.1 Gbps. Install 1 SFP and connect 1 fiber pair to the RRUS 4478 during initial install.
- Only use Ericsson supplied and approved SFPs RDH10247/3
- 2 external alarm inputs
- Max wind load @ 50m/sec = 260N
- Breaker size = 25A, DC Power Consumption = 880W (for dimensioning)
- 200mm horizontal separation required for side by side mounting
- 200mm separation required from antenna backplane to radio
- 600mm/800mm vertical outdoor/indoor separation required
- Min, Max DC cable size from squid to radio = 10,8 AWG
  - Adapter is required for 2-wire connection
  - Shielded DC cable is required
- Ground cable size = 2AWG
- Dimensions (incl. handles, feet and sunshield)
  - Height: 15” (420 mm)
  - Width: 13.2” (342 mm)
  - Depth: 7.3” (196 mm)
- Weight, excl. mounting hardware = 59.4 lbs (27 kg)

RRUS 4478 B14 CONNECTION INTERFACES



Position	Description	Marking
A	Antenna A	A
B	Antenna B	B
C	Antenna C	C
D	Antenna D	D
E	Antenna Line Device (ALD)(1).	ALD
F	48 V DC power supply	POWER
G	Grounding	⏚
H	Optical cable 1	1
I	Optical cable 2	2
J	External alarm	🔔
K	For future use	–

(1) Used for a Remote Electrical Tilt (RET) unit, for example.

CPRI, RET/AISG port, and ALD port caps have lanyards attached to the radio. DC and RF ports have protective caps to be removed when DC, RF connected to radio.

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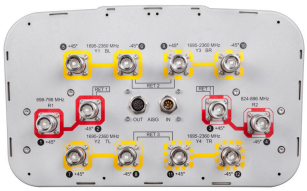
SBJAH4-1D65B-DL



12-port sector antenna, 2x 698–798, 2x 824-896 and 8x 1695–2360 MHz, 65° HPBW, 3x RET and low bands have diplexers

- Interleaved dipole technology providing for attractive, low wind load mechanical package
- Provides support for future Band 14 operations

General Specifications

Antenna Type	Sector
Band	Multiband
Color	Light gray
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Performance Note	Outdoor usage | Wind loading figures are validated by wind tunnel measurements described in white paper WP-112534-EN
Radome Material	Fiberglass, UV resistant
Radiator Material	Aluminum | Low loss circuit board
Reflector Material	Aluminum
RF Connector Interface	4.3-10 Female
RF Connector Location	Bottom
RF Connector Quantity, high band	8
RF Connector Quantity, low band	4
RF Connector Quantity, total	12

Remote Electrical Tilt (RET) Information

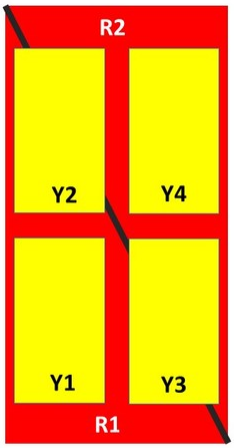
RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	1 female | 1 male
Input Voltage	10–30 Vdc
Internal RET	High band (2) | Low band (1)
Power Consumption, idle state, maximum	2 W
Power Consumption, normal conditions, maximum	13 W
Protocol	3GPP/AISG 2.0 (Multi-RET)

SBJAH4-1D65B-DL

Dimensions

Width	350 mm | 13.78 in
Depth	208 mm | 8.189 in
Length	1828 mm | 71.969 in
Net Weight, without mounting kit	26.5 kg | 58.422 lb

Array Layout



Array	Freq (MHz)	Conns	RET (MRET)	AISG RET UID
R1	698-798	1-2	1	ANxxxxxxxxxxxxxxxxx.1
R2	824-896	3-4		
Y1	1695-2360	5-6	2	ANxxxxxxxxxxxxxxxxx.2
Y3	1695-2360	9-10		
Y2	1695-2360	7-8	3	ANxxxxxxxxxxxxxxxxx.3
Y4	1695-2360	11-12		

(Sizes of colored boxes are not true depictions of array sizes)

Electrical Specifications

Impedance	50 ohm
Operating Frequency Band	1695 – 2360 MHz | 698 – 798 MHz | 824 – 896 MHz
Polarization	±45°

Electrical Specifications

Frequency Band, MHz	**698–798**	**824–896**	**1695–1880**	**1850–1990**	**1920–2180**	**2300–2360**
Gain, dBi	15.2	15.5	15.4	16.1	16.2	16.7
Beamwidth, Horizontal, degrees	68	65	63	63	65	65
Beamwidth, Vertical, degrees	11.7	10.3	11.3	10.4	9.8	8.9
Beam Tilt, degrees	2–14	2–14	2–14	2–14	2–14	2–14
USLS (First Lobe), dB	15	16	17	18	18	17
Front-to-Back Ratio at 180°,	29	31	30	33	32	34

dB						
Isolation, Cross Polarization, dB	28	28	28	28	28	28
Isolation, Inter-band, dB	30	30	30	30	30	30
VSWR | Return loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350	350	350	300

Electrical Specifications, BASTA

Frequency Band, MHz	**698–798**	**824–896**	**1695–1880**	**1850–1990**	**1920–2180**	**2300–2360**
Gain by all Beam Tilts, average, dBi	14.9	15.3	15.3	15.8	15.9	16.4
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.3	±0.5	±0.4	±0.4	±0.4
Gain by Beam Tilt, average, dBi	2 ° | 14.9 8 ° | 15.0 14 ° | 14.7	2 ° | 15.2 8 ° | 15.4 14 ° | 15.2	2 ° | 15.3 8 ° | 15.4 14 ° | 15.2	2 ° | 15.8 8 ° | 15.8 14 ° | 15.7	2 ° | 15.8 8 ° | 15.9 14 ° | 15.7	2 ° | 16.4 8 ° | 16.4 14 ° | 16.3
Beamwidth, Horizontal Tolerance, degrees	±1.7	±1.9	±3.4	±3	±4.0	±3.3
Beamwidth, Vertical Tolerance, degrees	±0.8	±0.6	±0.7	±0.7	±0.6	±0.3
USLS, beampeak to 20° above beampeak, dB	15	16	17	18	18	17
Front-to-Back Total Power at 180° ± 30°, dB	24	23	25	27	25	27
CPR at Boresight, dB	18	20	18	20	21	23
CPR at Sector, dB	10	12	9	13	12	9

Mechanical Specifications

Effective Projective Area (EPA), frontal	0.28 m² | 3.014 ft²
Effective Projective Area (EPA), lateral	0.24 m² | 2.583 ft²
Wind Loading @ Velocity, frontal	301.0 N @ 150 km/h (67.7 lbf @ 150 km/h)
Wind Loading @ Velocity, lateral	254.0 N @ 150 km/h (57.1 lbf @ 150 km/h)
Wind Loading @ Velocity, maximum	638.0 N @ 150 km/h (143.4 lbf @ 150 km/h)
Wind Loading @ Velocity, rear	319.0 N @ 150 km/h (71.7 lbf @ 150 km/h)
Wind Speed, maximum	241 km/h | 149.75 mph

Packaging and Weights

SBJAH4-1D65B-DL

Width, packed	450 mm | 17.717 in
Depth, packed	355 mm | 13.976 in
Length, packed	1975 mm | 77.756 in
Weight, gross	40.1 kg | 88.405 lb

Regulatory Compliance/Certifications

Agency	Classification
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system

Included Products

BSAMNT-3	–	Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

RRUS 4415 B25 DATA SHEET

For Turf Vendors

2017-11-02 Rev B

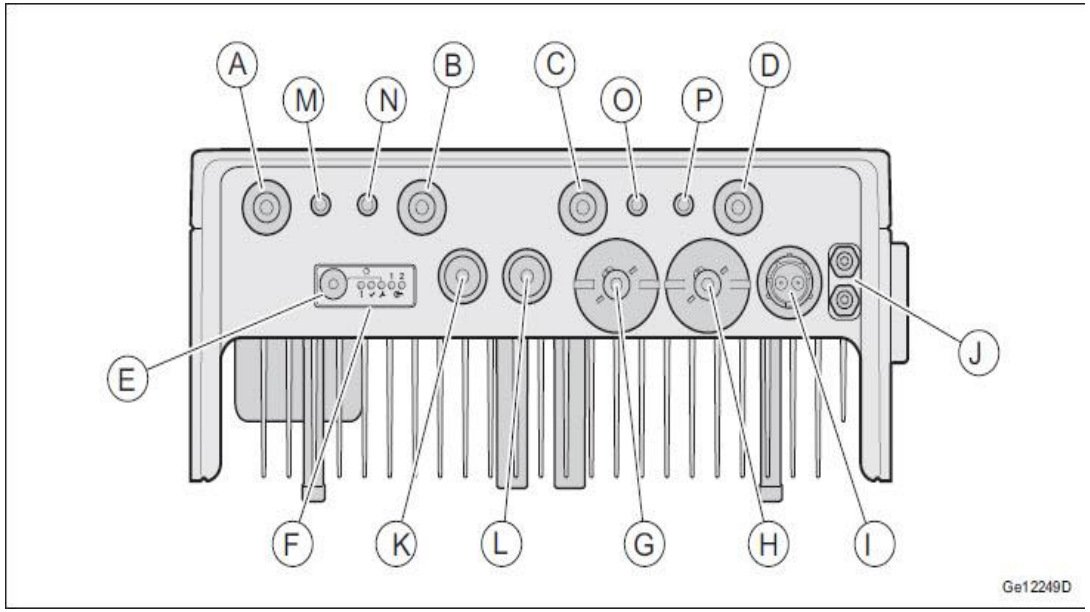
RRUS 4415 B25

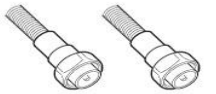
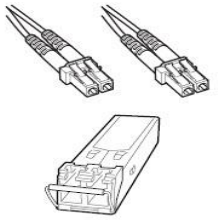
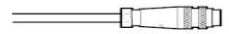
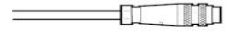
- B25
  - TX = 1930 – 1995 MHz
  - RX = 1850 – 1915 MHz
- CPRI 2 ports x 2.5/4.9/9.8/10.1 Gbps. Install 2 SFPs and connect 2 fiber pair to the RRUS 4415 during initial install.
- Only use Ericsson supplied and approved SFPs RDH10265/25

  Exception: SFP7 RDH 10265/3 for CPRI 1.4km to 10km

  Exception: SFP7 (pair): RDH 102 70/1 and RDH 102 70/2 for CPRI > 10km
- 2 external alarm inputs
- Max wind load @ 50m/sec = 260N
- Breaker size = 25A, DC Power Consumption = 670 W (for dimensioning)
- 200mm horizontal separation required for side by side mounting
- 200mm separation required from antenna backplane to radio
- 400mm vertical outdoor/indoor separation required between 2 radios
- 500mm vertical separation below antenna
- Min, Max DC cable size from squid to radio = 10,8 AWG
  - Adapter is required for 2-wire connection
  - Shielded DC cable is required
- Ground cable size = 2AWG
- Dimensions (incl. handles, feet and sunshield, w/o fan unit)
  - Height:16.5” (420 mm)
  - Width: 13.4” (342 mm)
  - Depth: 5.9” (149 mm)
- Weight, excl. mounting hardware = 46 lbs (21 kg)

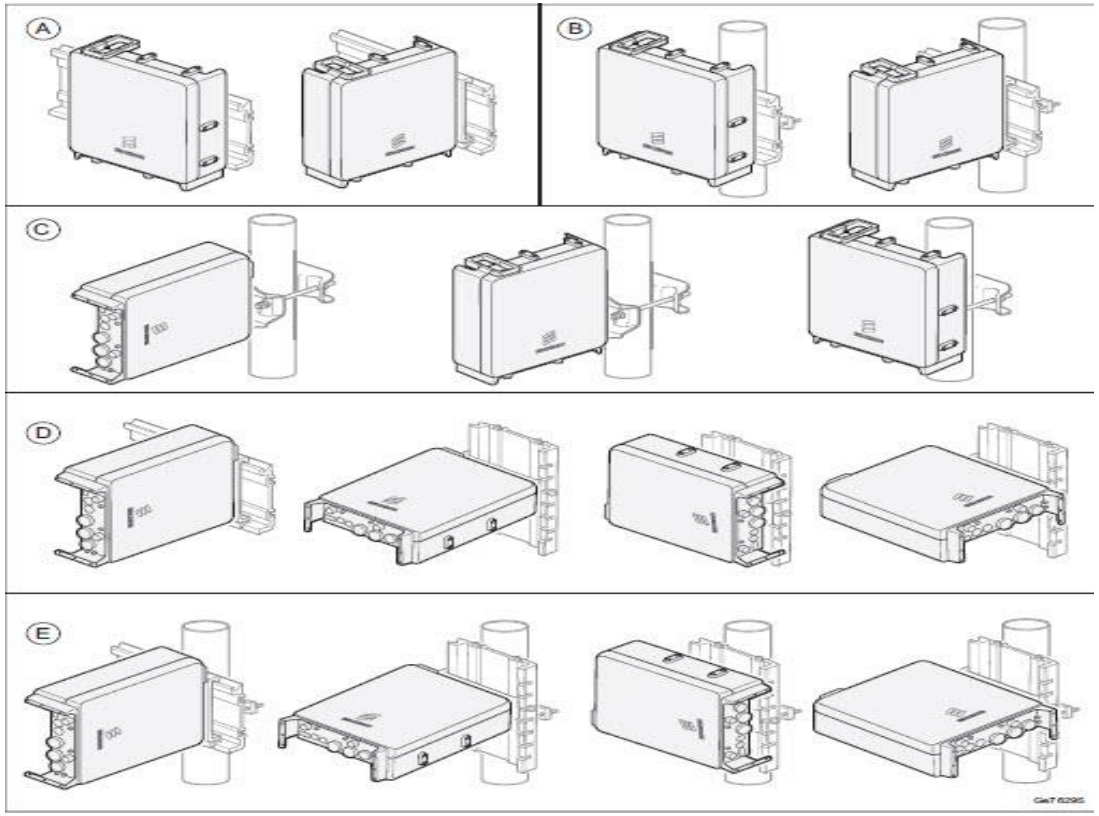
RRUS 4415 B25 CONNECTION INTERFACES



Position	Description	Marking	Connector Types	Cable Types
A	Antenna A	A	4.3-10 connector	
B	Antenna B	B		
C	Antenna C	C		
D	Antenna D	D		
E	Maintenance button	–	–	–
F	Optical indicators	!, ✓, 🔧, 1, 2	–	–
G	Optical cable 1	1	LC (On SFP) with support for FullAXS	
H	Optical cable 2	2		
I	−48 V DC power supply	POWER	Power connector	
J	Grounding	⏚	2 x M6 bolt	
K	External alarm and fan unit power supply and control		Mini-DIN connector, 14 pin	
L	ALD (used for a RET unit for example)	ALD	Mini-DIN connector, 8 pin	
M(1)	TX monitor A	A	SMA connector	
N(1)	TX monitor B	B		
O(1)	TX monitor C	C		
P(1)	TX monitor D	D		

CPRI, RET/AISG port, and ALD port caps have lanyards attached to the radio. DC and RF ports have protective caps to be removed when DC, RF connected to radio.

RRUS 4415 MOUNTING OPTIONS



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RRUS 32 B66 DATA SHEET

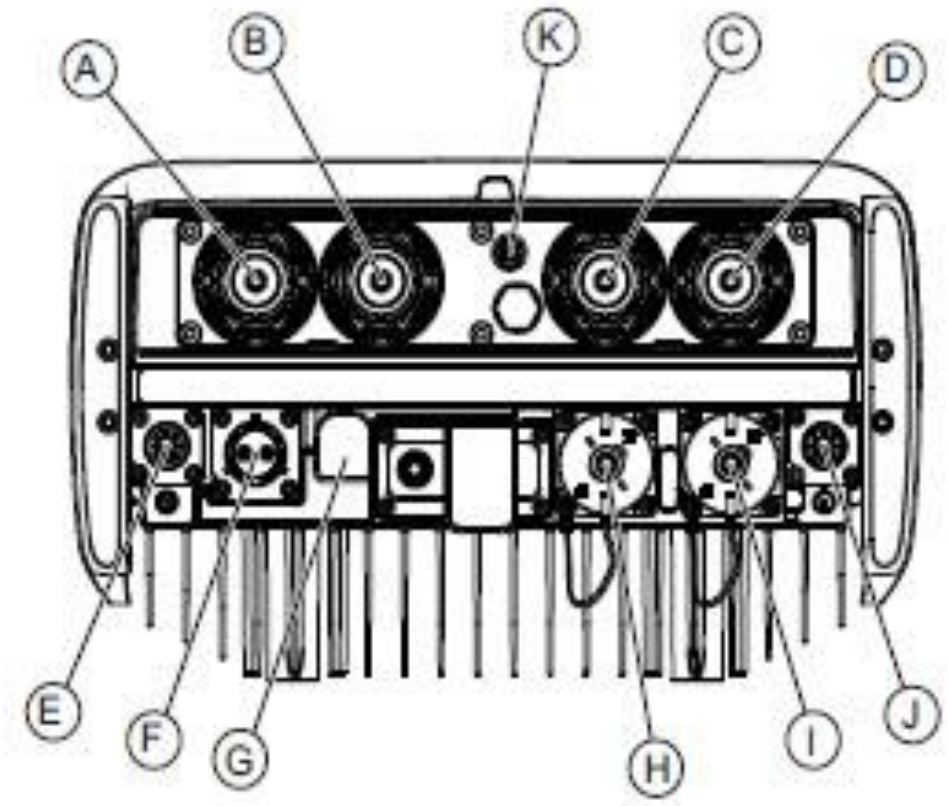
For Turf Vendors

2016-09-20 Rev F

RRUS 32 B66

- AWS
  - TX = 2110 – 2180 MHz
  - RX = 1710 – 1780 MHz
- CPRI 2 ports x 10 Gbps. Install 2 SFPs and connect 2 fiber pairs to the RRUS32 during initial install.
- Only use Ericsson supplied and approved SFPs RDH10247/3
- 6 external alarm inputs
- Max wind load @ 50m/sec = 350N
- Breaker size = 30A, DC Power Consumption = 880W (for dimensioning)
- 200mm horizontal separation required for side by side mounting
- 200mm separation required from antenna backplane to radio
- 600mm/800mm vertical outdoor/indoor separation required
- Min, Max DC cable size from squid to radio = 10,8 AWG
  - Adapter is required for 2-wire connection
  - Shielded DC cable is required
  - 8AWG is only to be used for NEMA enclosure, not a squid
- Ground cable size = 2AWG
- Dimensions (incl. handles, feet and sunshield)
  - Height: 27.2” (690 mm)
  - Width: 12.1” (306 mm)
  - Depth: 7.0” (178 mm)
- Weight, excl. mounting hardware = 53 lbs (24 kg)
- For 4T4R configuration, TX/RX ports 1&3 should be connected to the same polarization on antenna. TX/RX ports 2,4 should be connected to the other polarization on antenna.

RRUS 32 B2 CONNECTION INTERFACES



Position	Description	Marking
A	Antenna A	A
B	Antenna B	B
C	Antenna C	C
D	Antenna D	D
E	Antenna Line Device (ALD)(1).	ALD
F	48 V DC power supply	POWER
G	Grounding	⏚
H	Optical cable 1	1
I	Optical cable 2	2
J	External alarm	🔔
K	For future use	–

(1) Used for a Remote Electrical Tilt (RET) unit, for example.

CPRI, RET/AISG port, and ALD port caps have lanyards attached to the radio. DC and RF ports have protective caps to be removed when DC, RF connected to radio.

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RRUS 32 B30 DATA SHEET

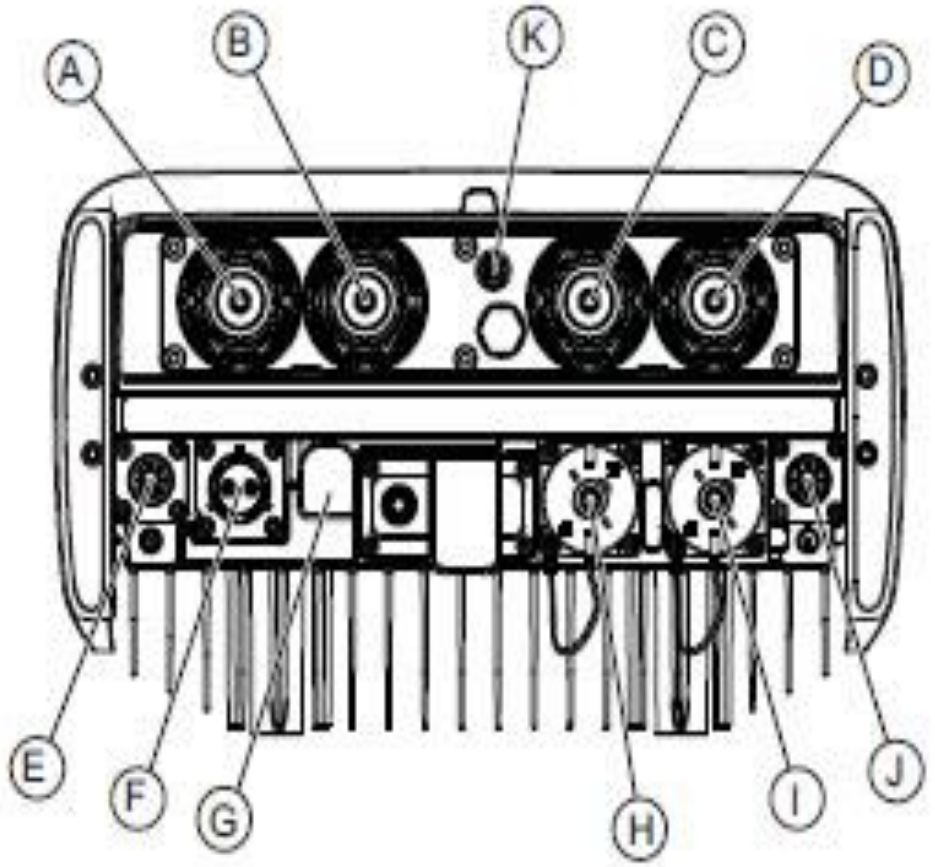
For Turf Vendors

2016-05-11 Rev G

RRUS 32 B30

- WCS A+B blocks
  - TX = 2350 – 2360 MHz
  - RX = 2305 – 2315 MHz
- CPRI 2 ports x 10 Gbps
- Only use Ericsson supplied and approved SFPs
- 6 external alarm inputs
- Max wind load @ 50m/sec = 350N
- Breaker size = 20A, DC Power Consumption = 800W
- 200mm horizontal separation required for side by side mounting
- 200mm separation required for antenna backplane to radio
- 600mm/800mm vertical outdoor/indoor separation required
- Max DC cable size from squid to radio = 8AWG
  - Adapter is required for 2-wire connection
  - Shielded DC cable is required
- Ground cable size = 2AWG
- Dimensions (incl. handles, feet and sunshield)
  - Height: 27.2” (690 mm)
  - Width: 12.1” (306 mm)
  - Depth: 7.0” (178 mm)
- Weight, excl. mounting hardware = 53 lbs (24 kg)

RRUS 32 B30 CONNECTION INTERFACES



Position	Description	Marking
A	Antenna A	A
B	Antenna B	B
C	Antenna C	C
D	Antenna D	D
E	Antenna Line Device (ALD)[1].	ALD
F	48 V DC power supply	POWER
G	Grounding	⏚
H	Optical cable 1	1
I	Optical cable 2	2
J	External alarm	🔔
K	For future use	–

(1) Used for a Remote Electrical Tilt (RET) unit, for example.

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Quintel®
New Dimensions in Wireless™

QD6616-7

6ft 65° MultiServ™ 16-Port Antenna

2x698-728MHz / 4x758-798MHz / 2x824-894MHz /8x1695-2400MHz

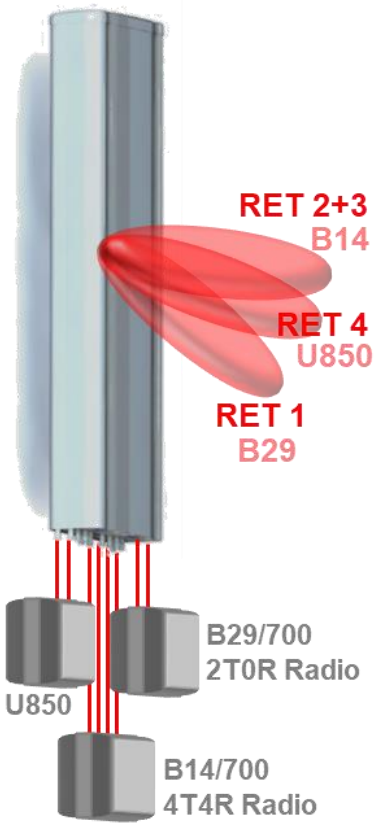
MultiServ.

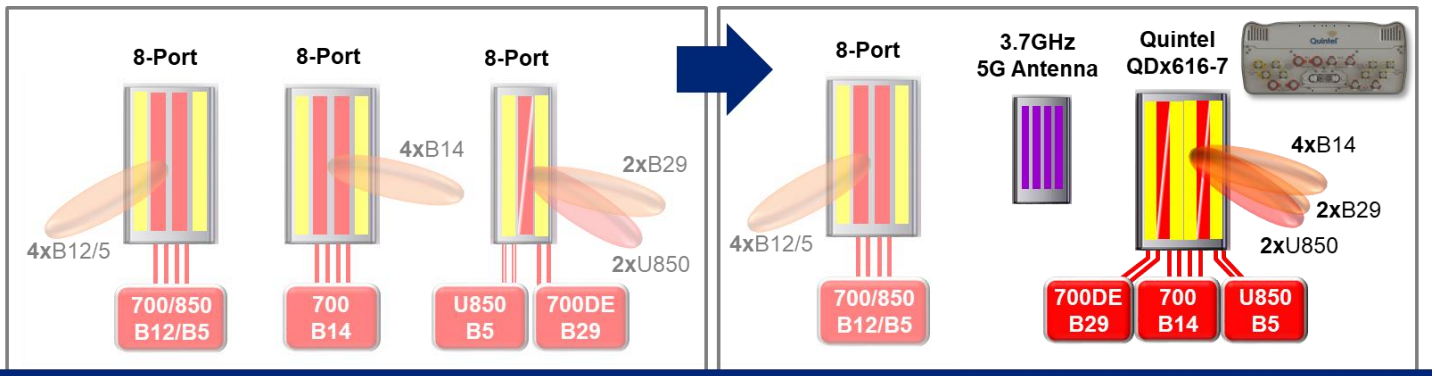
- Allows B29 and B5 services to share same antenna with B14
- Frees up an Antenna position at sites for 3.7GHz Antenna
- B29/B14 Cross-Band Internal PIM > 159dBc

- Full length Low & High-band Arrays for optimal VBW and Gain
- Best in class Quality, Internal and External PIM performance
- Patented Feed network for Optimal performance from Rooftops

Electrical Characteristics	Ports 1 2	Ports 3 4 5 6	Ports 7 8	Ports 9 - 16			
Polarization	±45°	2x ±45°	±45°	4x ±45°			
Operating Frequency (MHz)	698-728	758-798	824-894	1695-2400			
	698-728	758-798	824-894	1695-1880	1850-1990	2110-2180	2300-2400
Gain (dBi)	14.2	14.7	15.1	16.7	17.2	17.7	18.4
Azimuth beamwidth[1]	71±6.6°	65±4.6°	64±5.8°	70±6.5°	67±5.2°	62±4.5°	61±4.6°
Electrical down-tilt range	2°-14°	2x 2°-14°	2°-14°	2x 0°–9°			
Elevation beamwidth[1]	12.5±0.7°	11.3±0.4°	10.3±0.8°	7.0±0.4°	6.5±0.4°	5.7±0.2°	5.1±0.2°
BASTA Gain (dBi)	13.8±0.6	14.4±0.5	14.6±0.7	16.3±0.6	16.9±0.5	17.4±0.6	18.2±0.4
Min Tilt	14.3	14.5	14.9	16.3	16.9	17.3	18.1
Mid Tilt	13.9	14.6	14.8	16.4	17.0	17.4	18.3
Max Tilt	13.1	14.1	14.0	16.3	16.8	17.3	18.1
USLS 20°>mainbeam (dB)	11.4	11.8	11.5	11.7	12.4	15.6	14.6
FTB at 180°±30° (dB)[1]	18.4	17.6	17.8	28.2	28.2	28.8	28.0
Isolation Port to Port (dB)	36	35	36	35	35	37	37
Return loss/VSWR (dB)	14/1.5	14/1.5	14/1.5	14/1.5	14/1.5	14/1.5	14/1.5
X Polar at 0° (dB)[1]	17.6	15.5	15.3	18.6	18.6	18.8	19.3
Max Power handling (port)	75 Watts	100 Watts	200 Watts	250 Watts			
Max Power (all ports)	900 Watts						
PIM (dBc: 2x43dBm)	>153 (>159 X-Band B29/B14)			>153			

[1] *BASTA*





Application Example: Allows 3.7GHz deployment maintaining 3x Antenna Positions with all services

QD6616-7

6ft 65º MultiServ™ 16-Port Antenna

2x698-728MHz / 4x758-798MHz / 2x824-894MHz /8x1695-2400MHz

Mechanical Characteristics

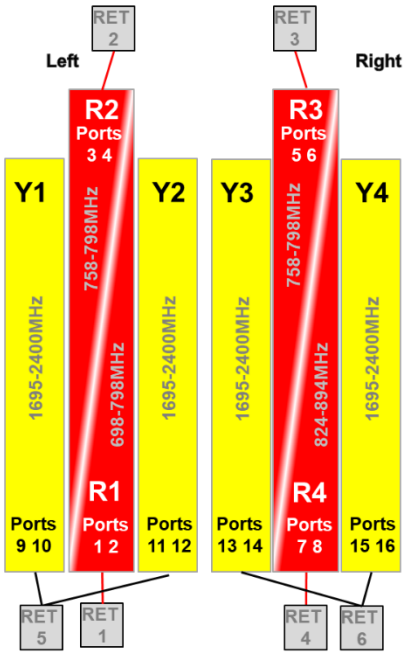
Dimensions	L 72”(1828mm) x W 22”(558mm) x D 9.6”(245mm)
Weight (excl mounting brackets)	130lbs (59.1kg)
No. of Connectors	16x 4.3-10.0 DIN Female Long Neck
Max Wind Speed	150mph (67m/s)
Equivalent Projected Area[2]	Front: 9.5ft² (0.89m²) Side: 3.1ft² (0.28m²)
Wind Load[2] @161km/h (45m/s)	Front: 243lbs (1081N), Side: 78lbs (348N)
Operating Temperature	-40°C to +65°C

[2] Equivalent Projected Area and Wind Load derived from simulation measurements. Equivalent Projected Area assumed C_d=1

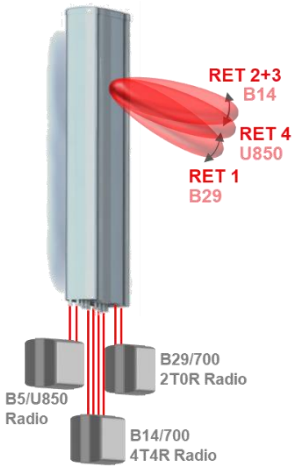
Fully Integrated RET Characteristics

Protocol	V 1.1/2.0/3GPP (SRET Type 1)
Surge immunity	IEC 61000-4-5:2005 4KV(AISG PIN)
AISG Data rate	9.6 kbps
RET Connectors	1x 8-Pin DIN Female & 1x 8-Pin DIN Male

Port Layout, Array Configuration and RET ID



RET ID	Ports				Arrays				Freq Range
1	1	2			R1				698-728MHz
2	3	4			R2				758-798MHz
3			5	6			R3		758-798MHz
4			7	8			R4		824-894MHz
5	9	10	11	12	Y1	Y2			1695-2400MHz
6	13	14	15	16			Y3	Y4	1695-2400MHz



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