Raycap

Small Cell Concealments Product Guide 2020

V2

Table of Contents

Small Cell Concealments Product Guide

About Raycap

Raycap is a solutions provider and manufacturer of telecommunications infrastructure products for mobile and broadband networks with operations throughout Europe and North America. In June 2018, Raycap acquired STEALTH® Concealment Solutions, the pioneer in concealment solutions for RF antenna equipment. Raycap | STEALTH has a large installed base in the United States and Europe, including connectivity and lightning protection solutions for telecommunications infrastructure, and RF concealments. As a known and trusted vendor for Tier-1, Tier-2 & Tier-3 carriers, Raycap products can be found in a wide variety of telecom sites with more than 400,000 site installations across North America alone.

Raycap's extensive integration and manufacturing experience along with STEALTH's expertise in RF concealments enables the company to provide operators with fully concealed, concealed, and non-concealed integrated pole solutions for 5G and next generation networks. More than 100 engineers on staff span disciplines such as structural, electrical, RF, chemical, mechanical, and electronics. Others are further specialized in telecom related fields such as network architecture, fiber optics, RF, signal testing, and PIM interference. Our strong in-house R&D and IP creation capabilities and our dedicated engineering resources enable us to provide quick turnarounds of photo simulations and renderings to assist customers in the municipality permitting process.

Manufacturing Facilities

Facilities in Drama, North Greece
A 30,000m² plant with engineering, product development, manufacturing, assembly and testing facilities, plus in house wet paint and powdercoat lines.

West Coast Facility, Post Falls ID
A 10,000m² plant with engineering, product development, manufacturing, assembly and testing facilities.

East Coast Facilities, Charleston SC
20,000m² fabrication and integration facility with full steel and composite fabrication capabilities plus in house wet paint and powdercoat lines.

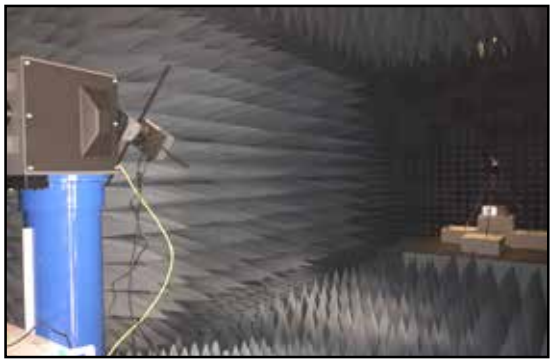
Our complete in-house design and manufacturing facilities have the capacity to produce more than 1,000 small cell, concealed or unconcealed poles per month. We provide our customers with:

- R&D Expertise
- Product Design
- Electrical and RF Engineering
- Metal Fabrication & Forming
- Cutting
- Welding
- Drilling
- Wet painting and powder coating lines
- Equipment Integration & Cabling
- Trouble Free Commissioning & Activation
- Assembly
- RF Testing
- Thermal Testing
- Fiber Optic Testing
- Electrical Testing
- Warehousing, Crating, Shipping

Testing and Measurement

Raycap conducts measurements in an RF (radio-frequency) anechoic chamber at its partner's facilities in San Antonio, Texas using a network analyzer, specifically measuring the complex transmission S21 (i.e., magnitude and phase) over the 700 MHz-100 GHz range. To cover that frequency range, measurements are done across six frequency bands, using different horn antennas for each band. Inserting a material between the transmit and receive parts generally causes loss of energy (absorption) which shows up as a negative value in dB, as well as a phase delay, shown as a negative phase angle. All results are recorded for every material that is considered for concealment solutions.

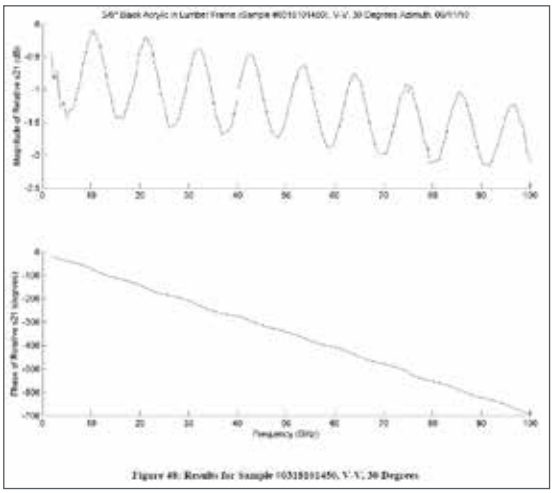
RF Test Capabilities



RF insertion loss testing for all commonly used frequencies from 700 MHz to 100 GHz, including detailed pattern impact testing at mmWave frequencies.

10+ year testing history with Southwest Research Institute (SwRI) in San Antonio, TX on all concealment materials used.

ENV Test Capabilities



Experience in the field of environmental testing according to UL, NEBS, GR, ISO, EN, MIL, ASTM standards.

Project scope for poles defined and initiated with UL, RTP:

- UL Project Number 4788755381, Product Category NWGQ
- Complete UL Listing expected Q3, 2019

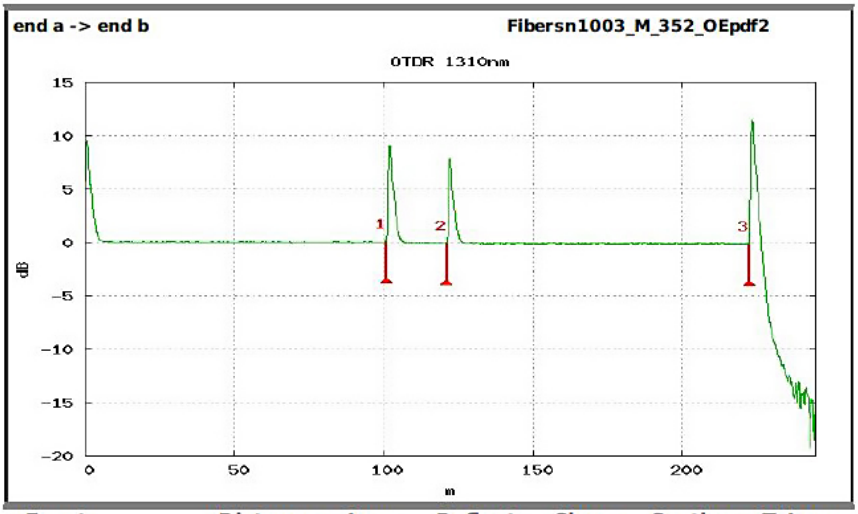
Verification of initial cooling (active – passive) performance simulations and actual measurements for low noise level requirements (below 40dBA).

Supervised anti-vandalism tests according to DIN ENV 1627 (RC2/WK2 burglar resistance tests).

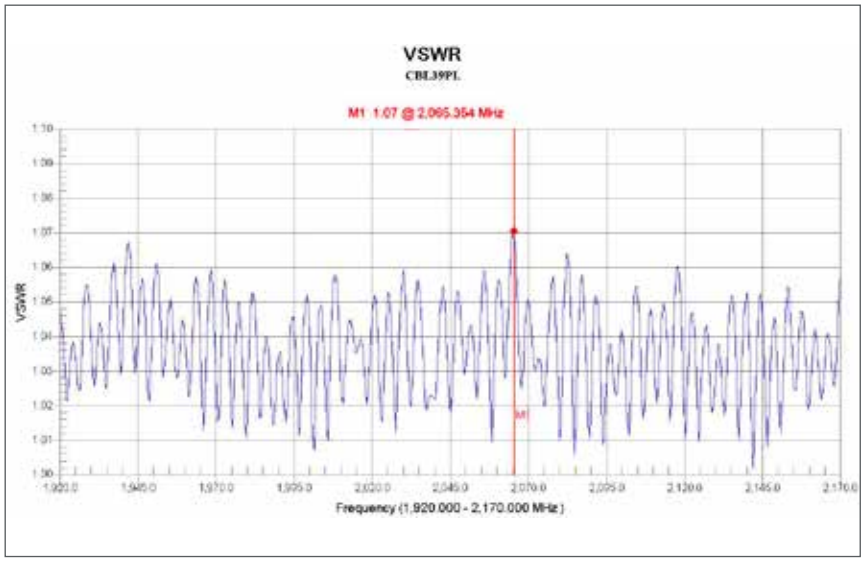
Quality Inspection

Quality inspection is of fundamental importance before any solution is dispatched. Performing all measurements in a controlled environment guarantees less complications during field installation and minimizes commissioning and activation time. For the integrated poles, we conduct several inspections of every cable line:

- RF quality measurements (VSWR, PIM)
- Fiber optic quality measurements (OTDR)
- Power quality measurement (continuity, earth leakage, power ON load tests)
- Quality inspection checklist



Event		Distance	Loss	Reflect.	Slope	Section	T. Loss
		m	dB	dB	dB/km	m	dB
1		101.11	0.073	-49.78	0.213	101.11	0.018
2		121.26	0.046	-52.12		20.15	0.097
3		222.48		-44.72	0.396	101.23	0.182



Electrical Safety

The luminaire pole houses a proprietary load distribution center capable of providing up to 12 branch circuits at 120VAC, or 6 branch circuits at 240VAC. This distribution equipment is also certified to UL67 Panelboards (E479137) and meets the requirements of being Suitable for Service Equipment (SuSE).

As part of the production line testing required under UL 1598, both a Bonding Circuit Impedance test and a Dielectric Voltage-Withstand test have been taken.

Raycap recently completed all the necessary testing as per UL 1598 Standard for Safety. The relevant certificate of compliance follows.

CERTIFICATE OF COMPLIANCE

Certificate Number	20190826-E483273
Report Reference	E483273-20190813
Issue Date	2019-AUGUST-26
Issued to:	RAYCAP INC 806 S Clearwater Loop Post Falls, ID 83854
This certificate confirms that representative samples of	LUMINAIRE POLES Model RCP-6X
	Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	UL 1598, Luminaires.
Additional Information:	See the UL Online Certifications Directory at https://iq.ulprospector.com for additional information.

This *Certificate of Compliance* does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

Bruce Mahrenholz, Director North American Certification Program

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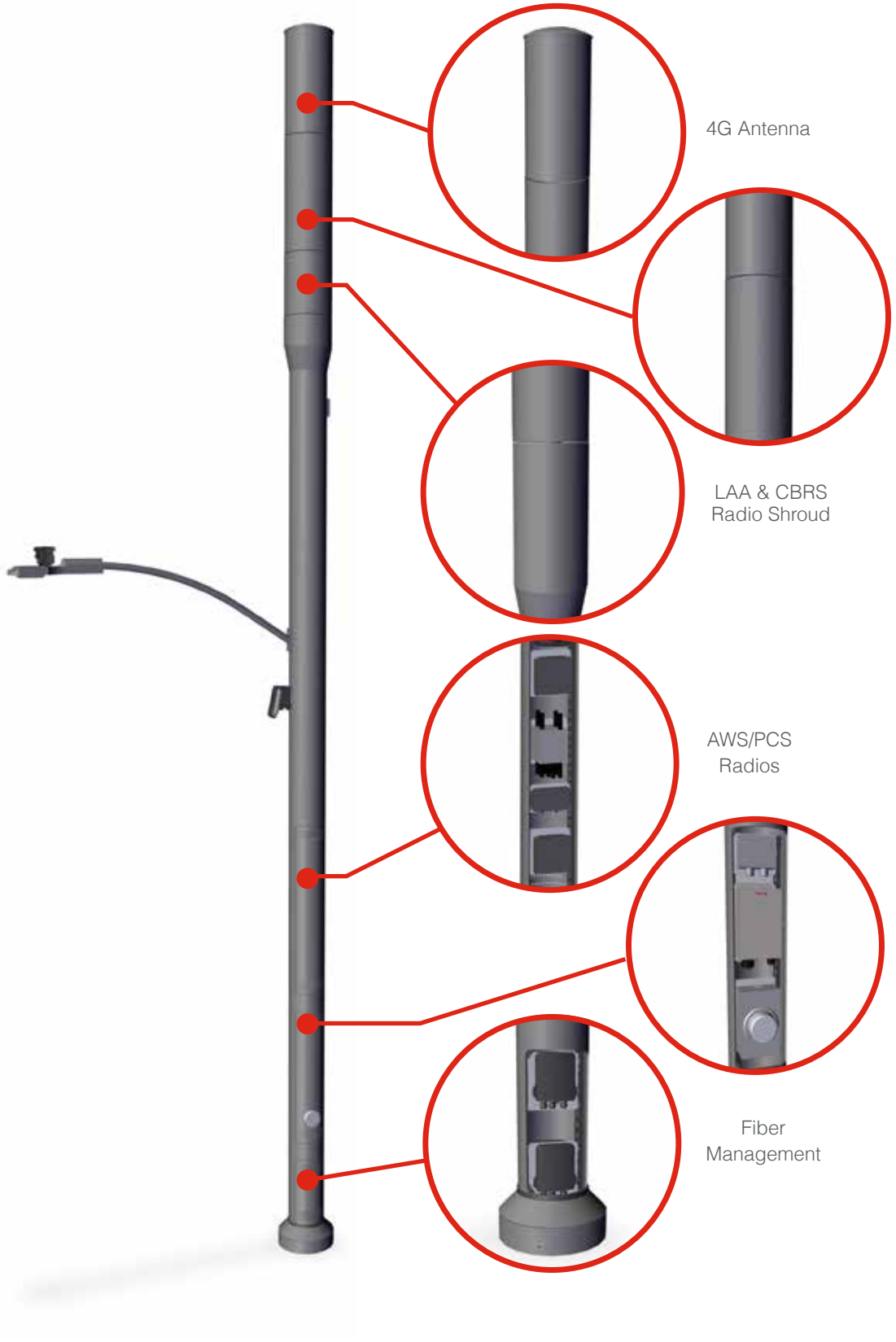
Page 1 of 1

Fully Concealed

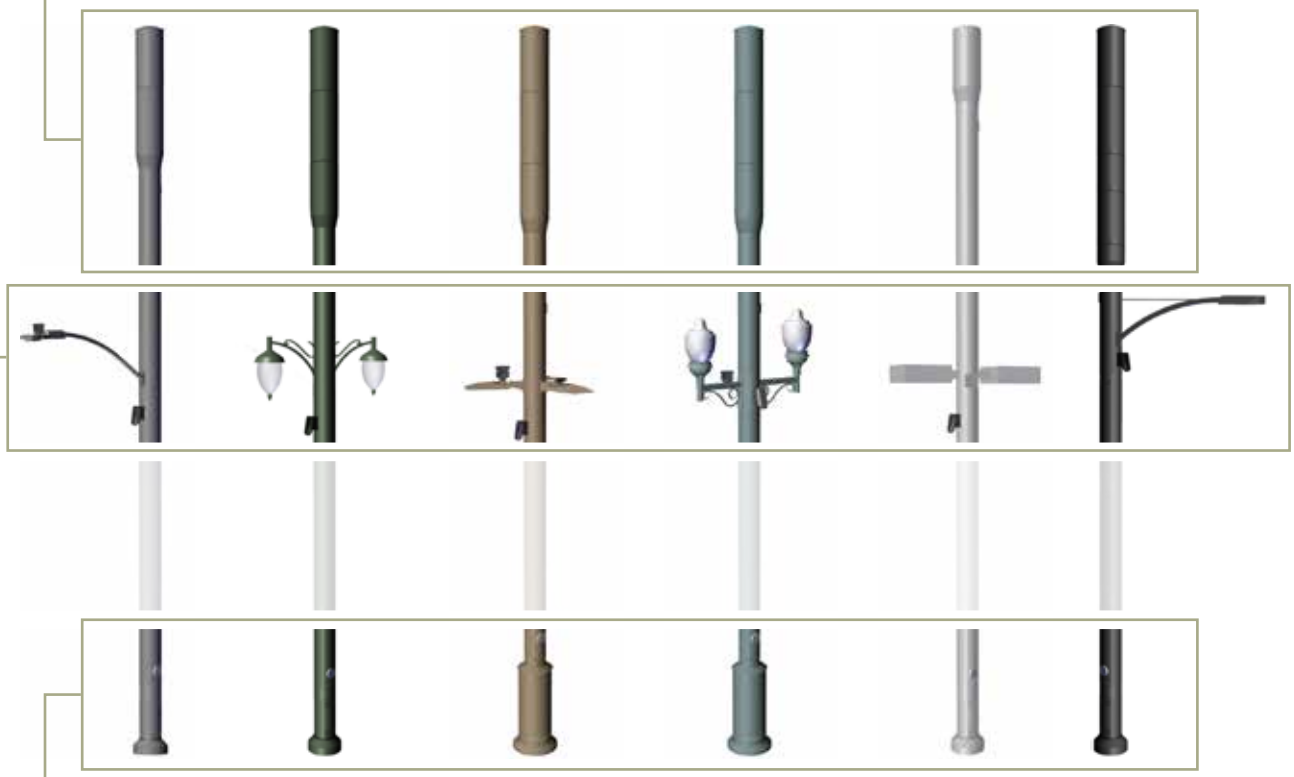
Raycap's STEALTH fully concealed small cell poles are built to meet certain specifications and maintain maximum RF performance. They are designed for flexibility, performance and aesthetics. We offer pole varieties which can be delivered fully integrated, with color options.



Fully Concealed

Radio / Technology

Raycap's STEALTH small cell poles are designed to customer specifications, can be delivered fully or partially integrated, and can accommodate all radio technologies.



Bases

Decorative bases can be installed around existing poles to hold power and fiber distribution equipment, as well as radio equipment. Structural bases also perform this function, but can also support an existing or new lightpole installed on top of the structural base.

Structural

Structural bases are made to replace bases on existing poles

Decorative

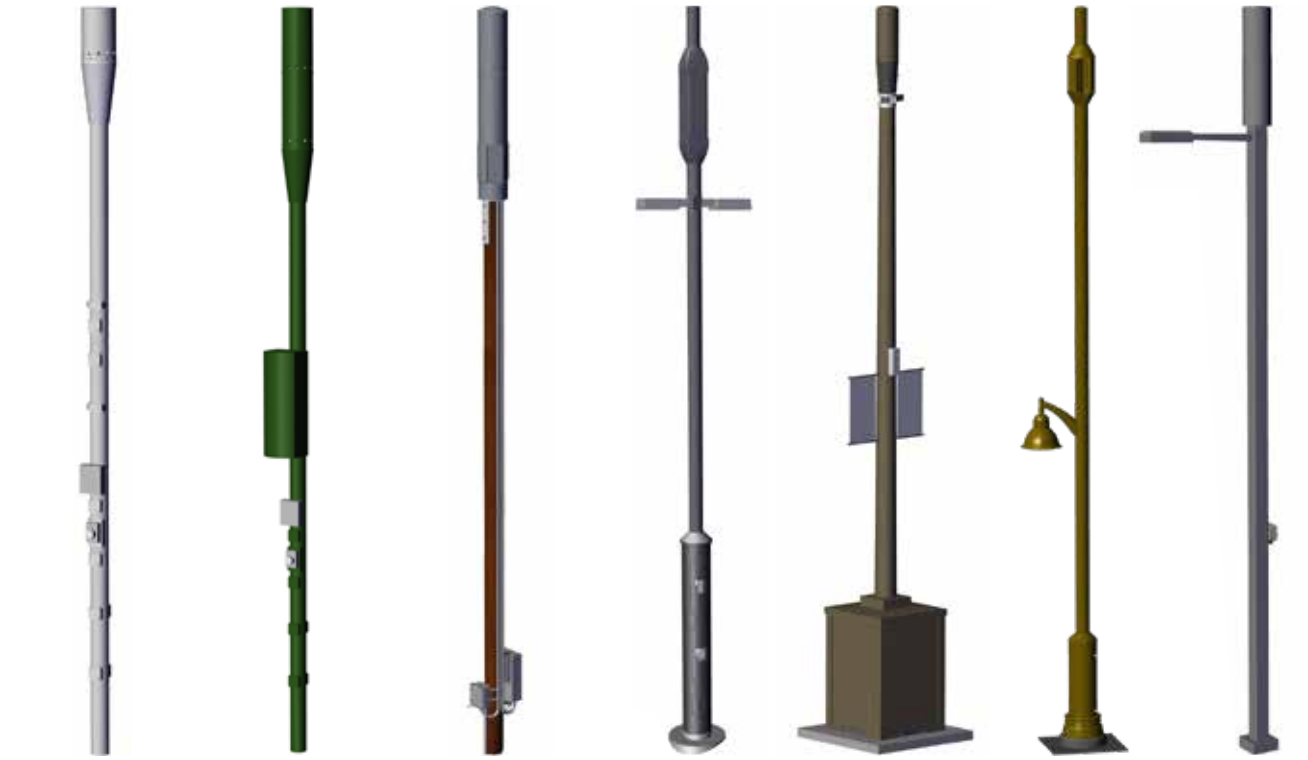
Decorative bases are available on brand new poles

Luminaries and Attachments

Fully concealed pole solutions can be ordered with optional lighting or attachments to match existing surrounding light poles. Poles can also be engineered to re-use existing luminaires to reduce site costs and lead time.

Concealed & Non-Concealed

Concealed and non-concealed poles are suitable for situations when full concealment is not necessary.



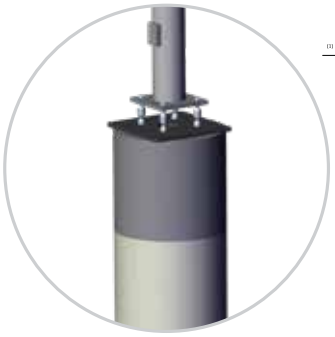
Optional Pre-Fab Foundation

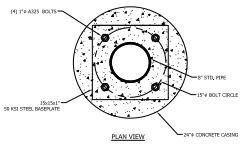
Raycap can provide customers with traditional poured-in-place foundation designs, as well as alternative pre-fabricated foundation options to help expedite deployment.

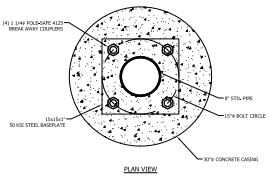
Options include:

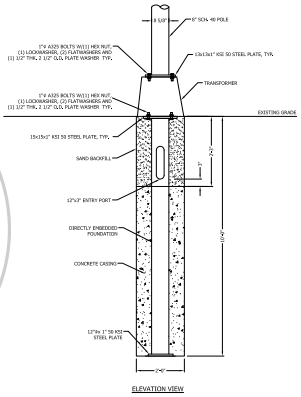
- Direct Embedded
- Mechanical/Helical
- Pre-Cast
- Break-Away Mechanisms

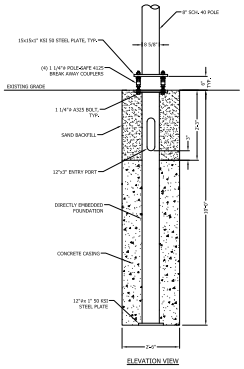
Contact us directly for more information.











Integration Options

Our broad experience in integration services enables us to help our customers by manufacturing a fully or partially integrated concealed small cell pole product.

STEALTH fully integrated concealed small cell poles arrive at a customer's site with cabling, radios, and power/fiber equipment, pre-installed and pre-tested. In the case of fully integrated poles, all that is needed for installation is to set the pole on the foundation, then hook up the feed lines for power and fiber. This is a much faster solution than the traditional method of hiring field crews to install electrical components and run cabling. Taking advantage of Raycap's expertise in integration saves customers time and money.

Pole Color Options

RAL 6012 RAL 7022 RAL 7013 RAL 7040 RAL 7047 RAL 9011 RAL 8008

RAL Color	Description
6012	Black Green
7022	Umbra Gray
7013	Brown Gray
7040	Window Gray
7047	Telegray
9011	Graphite Black
8008	Olive Brown

Custom colors available upon request

InvisiWave™ Proprietary 5G mmWave Material

Raycap has performed extensive research and testing in the frequency ranges of 28GHz, 37GHz, 39GHz and up to 52GHz bands to produce its InvisiWave material that is suitable for the concealment of 5G mmWave systems in the U.S. market. These higher frequency applications are much more sensitive to concealment materials being placed in the antenna path.

After nearly a year of problem-solving and testing, and with input and approval from industry stakeholders, the Raycap | STEALTH team has a solution that meets the concealment needs of next generation small cell networks.

In order to validate performance and determine the best possible materials for different concealment applications, all candidate materials were subjected to an array of tests and ultimately the material has proven to provide the performance needed while still maintaining the qualities needed in a good concealment material. The InvisiWave material is available to be used in pole toppers, surrounds and radomes as well as for panel products like chimneys, cupolas and other rooftop concealments.

- Covers and hides mmWave equipment attached to poles or other structures without interfering in performance
- Fabricated from RF friendly, 3mm material
- Easy to install
- Tested from 700MHz to 52GHz
- Features minimum dB loss
- Thoroughly tested to identify beamforming impact
- Hydrophobic surface
- Compatible to back lobe mitigation techniques with use of upgrade kits
- Patent pending design
- Custom sizes available based on a case by case basis
- Materials are approved for smooth textures only
- Field painting is not recommended but film textures are available
- Radomes are all one-piece with a 14” - 36” diameter range and can be up to 10’ tall
- Radomes require continuous rolled ring bulkheads for proper attachment
- Patent-pending material

InvisiWave Technical Specifications

Property	Method	Units	Value
Thickness		mm	3
Density	ASTM D-792	g/cm8	0.6 +/- 0.02
Flexural Modules	ASTM D-790	mPa	1600
Shore Hardness	ASTM D-2240	Shore D	60
Flammability	UL94		V-0
Flammability (Smoke Developed)	ASTM E84/ ASTM E2768		10 (550)/7.4ft
Surface Resistance	ASTM D-257	Ohm	$4.1x10^{14}$
Heat Deflection Temperature	ASTM D-648 @ 1.8Pa Load	°C	62
Coefficient of Thermal Expansion	ASTM D-696	10-5/°C	6.7
Tested/Approved Spectrum	sub 6GHz, 24GHz, 28GHz and 39GHz		
Flammability Certification	Class ‘A’ Fire rated – City of Los Angeles Dept. of Building & Safety Approved (LARR)		

InvisiWave™ 5G mmWave Pole Mounted Solutions

Raycap | STEALTH's exclusive InvisiWave solution for pole mounts is approved for use at mmWave frequencies including 24GHz, 28GHz, and 39GHz, as well as being fully backwards compatible with all commonly used sub-6GHz frequencies.

RCM-9972-IW

RCM-7803-IW

RCM-5393-IW

RCM-6050-IW

RCM-7659-IW

RCM-3118-IW

RCM-7055-IW

Front is InvisiWave and is intended to house a 5G mmWave radio

Pole Toppers

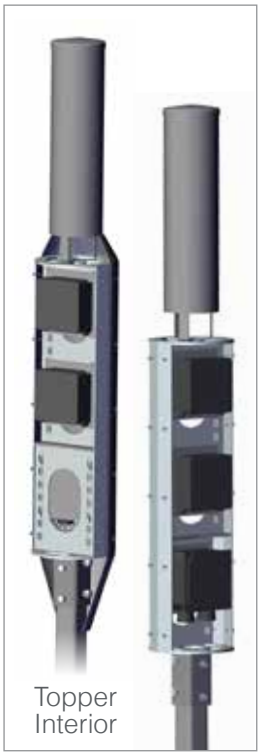
InvisiWave™

For Wood or Metal Poles

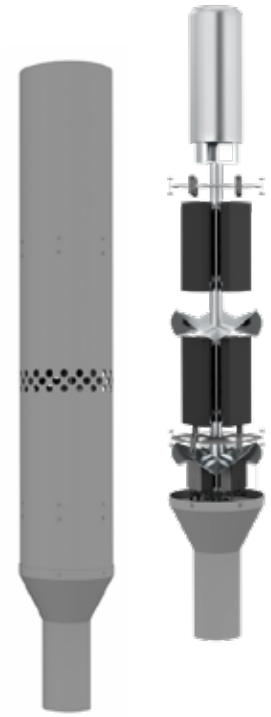
Available in a variety of types from 4G only to 4G/5G or 5G only, STEALTH Pole Toppers fit onto existing poles and are available in both concealed and non-concealed styles.

Any STEALTH Pole Topper can be designed with InvisiWave radomes to accomodate 24GHz frequencies.

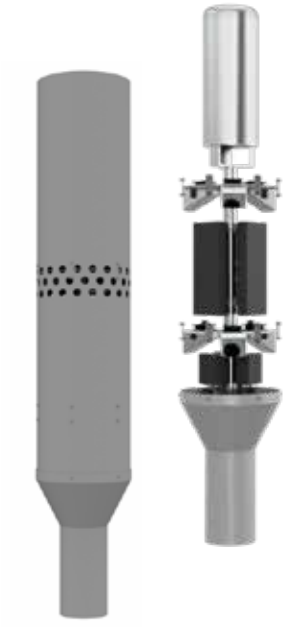
- Overall height can be adjusted as required
- Concealment can be designed to various diameters to meet operator and/or municipality requirements
- Can be ordered in various colors to blend in with the surrounding environment



RTR-3733-X
4G & 5G



RTR-2789-IW



RTR-1694-IW

RTR-9397-IW

Pole Toppers

For Wood or Metal Poles

4G+5G Pole Toppers

InvisiWave™

- Complete solution for 5G radios and 4G cannister antenna; options available for CBRS & LAA radios
- Fully concealed with proprietary InvisiWave mmWave material
- Through bolted connection style; alternative connection types available for different pole styles
- Accommodates all small cell 4G cannister antennas and 5G OEM Radios
- Variable pole diameter – Attaches to most common sizes
- All structural steel hot dip galvanized per ASTM A123 with optional powder coated finish to customer color specification
- Optional 2nd carrier 5G section or 4G radio section (shown on RTR-8464-IW)

RTR-4072-IW Model Number Configuration

RTR-4072-IW-a-b-cc-d-ee

a: Antenna Type	
0	= Universal Mount

b: Ventilation	
0	= Passive
1	= Active (Fans)

cc: Radio Type	
01	= E/// 6701
02	= E/// 5221
03	= E/// 5331
04	= Nokia AEUA/AEWA
05	= Nokia AEUB/AEWB
06	= Samsung HT4401/2
07	= Samsung AT1K01/2

d: Pole Diameter	
1	= 4" to 7"
2	= 8" to 10"
3	= 11" to 14"

ee: Galv or RAL color	
00	= Galvanized only
01	= RAL6012
02	= RAL7022
03	= RAL7013
04	= RAL7040
05	= RAL7047
06	= RAL9011
07	= RAL8008

RTR-4072-IW

RTR-8464-IW Model Number Configuration

RTR-8464-IW-a-b-cc-d-ee

a: Antenna Type	
0	= Universal Mount

b: Ventilation	
0	= Passive
1	= Active (Fans)

cc: Radio Type	
01	= E/// 6701
02	= E/// 5221
03	= E/// 5331
04	= Nokia AEUA/AEWA
05	= Nokia AEUB/AEWB
06	= Samsung HT4401/2
07	= Samsung AT1K01/2

d: Pole Diameter	
1	= 4" to 7"
2	= 8" to 10"
3	= 11" to 14"

ee: Galv or RAL color	
00	= Galvanized only
01	= RAL6012
02	= RAL7022
03	= RAL7013
04	= RAL7040
05	= RAL7047
06	= RAL9011
07	= RAL8008

RTR-8464-IW

Pole Toppers

For Wood or Metal Poles

4G+5G Pole Toppers
Unconcealed

- Complete solution for 5G radios and 4G cannister antenna; options available for CBRS & LAA radios
- Through bolted connection style; alternative connection types available for different pole styles
- Accommodates all small cell 4G cannister antennas and 5G OEM Radios
- Variable pole diameter – Attaches to most common sizes
- All structural steel hot dip galvanized per ASTM A123 with optional powder coated finish to customer color specification
- Optional 5G radio composite decorative surround (shown on RTR8221)

RTR8221

REM8287

Model Number Configuration

RXXxxxxabccdee

Mount Type	
RTR8221	= Mount with Surround
REM8287	= Mount (No Surround)

a: Antenna Type	
0	= Universal Mount

b: Cable Shroud	
0	= Not Present
1	= Included

cc: Radio Type	
01	= E/// 6701
02	= E/// 5221
03	= E/// 5331
04	= Nokia AEUA/AEWA
05	= Nokia AEUB/AEWB
06	= Samsung HT4401/2
07	= Samsung AT1K01/2

d: Pole Diameter	
1	= 4" to 7"
2	= 8" to 10"
3	= 11" to 14"

ee: Galv or RAL color	
00	= Galvanized only
01	= RAL6012
02	= RAL7022
03	= RAL7013
04	= RAL7040
05	= RAL7047
06	= RAL9011
07	= RAL8008

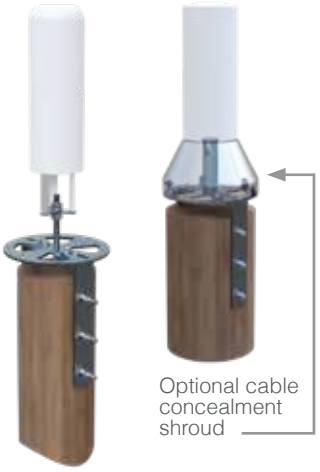
Equipment Mounts / Hardware

Raycap offers pole mount hardware for easy installation of equipment on exsisting poles. They are specifically designed for fast installation and easy access.

4G Top-Mount Solutions

- Accommodates all small cell cannister antennas
- Variable pole diameter – Attaches to most common sizes
- All structural steel hot dip galvanized per ASTM A123 with optional powder coated finish to customer color specification
- Optional cable concealment shroud available for all models

REM-9129
– Adjustable bolted clamp-on attachment



REM-5986
– Through bolted connection style

REM-2053
– Adjustable strap design

Model Number Configuration

REM-xxxxabcdd

Mount Type	
9129	= Bolted clamp-on
5986	= Through Bolted
2053	= Adjustable Strap

a: Antenna Type	
0	= Universal Mount

b: Cable Shroud	
0	= Not Present
1	= Included

c: Pole Diameter	
1	= 4" to 7"
2	= 8" to 10"
3	= 11" to 14"

dd: Galv or RAL color	
00	= Galvanized only spine and shroud RAL7040
01	= RAL6012 spine and shroud
02	= RAL7022 spine and shroud
03	= RAL7013 spine and shroud
04	= RAL7040 spine and shroud
05	= RAL7047 spine and shroud
06	= RAL9011 spine and shroud
07	= RAL8008 spine and shroud

Equipment Mounts / Hardware

5G Mount Solutions

- Accommodates all 5G mmWave radios or Small Cell 4G Panel Antennas
- Variable pole diameter – Attaches to most common sizes
- All structural steel hot dip galvanized per ASTM A123 with optional powder coated finish to customer color specification
- Many options for radio configurations and downtilt

REM-8224
– Adjustable bolted clamp-on attachment

REM-4032
– Through bolted connection style

REM-7136
– Through bolted connection style

REM-4046
– Through bolted connection style

Model Number Configuration

REM-xxxxabcdd

Mount Type	
8224	= Bolted clamp-on (3 Radio)
4032	= Through Bolted (3 Radio)
7136	= Through Bolted 2 Bracket
4046	= Through Bolted T-Bracket

a: Radio Type	
01	= E/// 6701
02	= E/// 5221
03	= E/// 5331
04	= Nokia AEUA/AEWA
05	= Nokia AEUA/AEWB
06	= Samsung HT4401/2
07	= Samsung AT1K01/2

b: Bracket Length	
00	= Standard Bracket
10	= 10' extension
20	= 20' extension
30	= 30' extension

c: Pole Diameter	
1	= 4" to 7"
2	= 8" to 10"
3	= 11" to 14"

dd: Galv or RAL color	
00	= Galvanized Only
01	= RAL6012
02	= RAL7022
03	= RAL7013
04	= RAL7040
05	= RAL7047
06	= RAL9011
07	= RAL8008

Equipment Mounts / Hardware

4G Side-Mount Solutions

- Accommodates all small cell cannister antennas
- Variable pole diameter – Attaches to most common sizes
- All structural steel hot dip galvanized per ASTM A123 with optional powder coated finish to customer color specification
- Many options for arm length and antenna mounting position
- Radio attachment options available (in addition to antenna)

REM-2607
– Adjustable bolted clamp-on attachment

REM-7945
– Through bolted connection style

REM-3603
– Adjustable strap design

Model Number Configuration

REM-xxxxabcdd

Mount Type	
2607	= Bolted clamp-on
7945	= Through Bolted
3603	= Adjustable Strap

a: Antenna Type	
0	= Universal Mount

b: Bracket Length	
10	= 10'
20	= 20'
30	= 30'

c: Pole Diameter	
1	= 4" to 7"
2	= 8" to 10"
3	= 11" to 14"

dd: Galv or RAL color	
00	= Galvanized only
01	= RAL6012
02	= RAL7022
03	= RAL7013
04	= RAL7040
05	= RAL7047
06	= RAL9011
07	= RAL8008

Equipment Mounts / Hardware

Miscellaneous Mounts

In certain circumstances, unique or custom mounting may be required. In those situations we have several options and styles to accomadate those scenarios.

REM-6024
– Strand Mount
– Multiple mounting hole options available
– Customization available upon request

RCS-7659
– Antenna cable shroud for 5G radios
– Provides cable concealment and protection
– Fabrication fit to radio used

REM-2904
– Situational Wall Mount
– Multiple mounting hole options available
– Customization available upon request

REM-2974
– Situational Wall Mount
– Multiple mounting hole options available
– Customization available upon request

REM-8908
– Situational Wall Mount
– Multiple mounting hole options available
– Customization available upon request

REM-5289
– Equipment Off-Set Mounting
– Crank-shaft style mounting

REM-2955
– Antenna Mount
– Situational Mounting
– Through-Pole Mounting Application

Side Mounted Solutions

Pole Mounted Infrastructure

In some locations installation on the ground is not possible. Whether due to lack of space, permit restrictions or even a costly installation of power and/or fiber cables for the connectivity, this scenario requires the installation of active equipment (antennas and connectivity enclosures) on or at the side of an existing structure. We have developed several side mounted solutions for existing light poles as well as additional approaches that can be wall mounted.

Side Mounted Cages

- Shroud passive vented design
- Door access design allows easy access
- Construction:
  - Aluminum cage
  - Stainless steel mast supports
- Many color finishes and heights available

DoITT Box

- Radio Enclosure for 4G and 5G applications
- Metallic construction (stainless steel) for support of third party equipment: 1 x AEUD, 1 x AEUE, 2 x AHIB, 2 x BK-745E (or equivalent)
- Includes AC power management and active cooling system
- Mount secures with bolts around top of pole
- Many color finishes

Pole Collar

- Antenna Top-Mount
- Mount secures with bolts around top of pole
- Many color finishes

Painted / Concealed Poles

Pole Mounted Infrastructure

Raycap | STEALTH have what it takes when it comes to providing the right solutions for customer needs. Our steel poles are painted to look like wood, and constructed / painted in our own factories. These poles are purpose built to accommodate power and fiber lines on the interior, and are available in different finishes, sizes and widths to accommodate the needs of the surrounding environment.

- Steel construction painted in wood finish
- Available in various finishes, sizes and widths
- Accommodate internal power and fiber runs

Enclosures next to existing poles

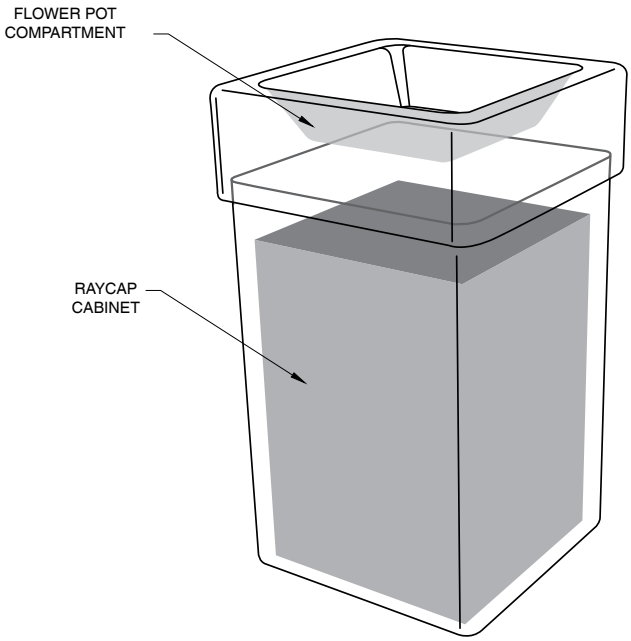
Raycap has developed a modular small cell cabinet solution that can be seamlessly integrated in various environments. The solution is comprised of two parts; the lower part hosts equipment while the upper part is decorative.

Depending on the equipment (single band, dual band or multiband), there are two (2) sizes for the lower compartment. For the decorative part, there are three (3) variants: plant, recycle bin and map. This modular approach gives customers the flexibility to choose among different configurations and adapt the appearance based on the surrounding environment.

Planter Box

Enclosures next to existing poles

- Modular design
- Lower compartment with:
  - Electrical components
  - Fiber optic components
  - Active Equipment
  - Ventilation System
  - Locking mechanism
  - Cable entry system
- Decorative part is a planter box:
  - Easy detachment
  - Drainage system available
  - Plastic or real plants to be considered



Enclosures next to existing poles / Planter Box






Wall Mounted Solutions

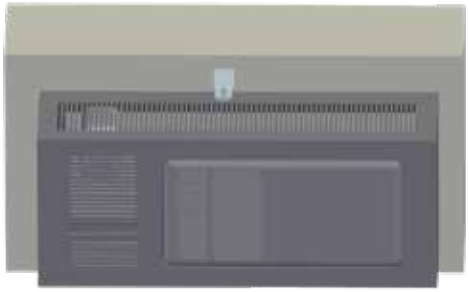
Product solutions covering rooftop small cell sites with a screen wall, side-mounted box, sign, chimney, pod, or cupola, are available from Raycap. Rooftop or wall side-mounted box concealments compliment existing construction, and hand-crafted faux brick, block, stucco, and stone textures seamlessly blend with buildings.

Wall Mounted Signs

- Conceals small cell equipment
- Appears natural in the surrounding area
- Multiple operator and 5G/ InvisiWave versions available

HVAC Concealment

- Conceals small cell equipment
- Appears natural in the surrounding area
- Multiple operator and 5G/ InvisiWave versions available



Custom Concealment Shrouds

- Conceals small cell equipment
- Blends into any existing facility
- Round form factor shown; shrouds can be any shape including square, rectangular, or multisided
- Multiple operator and 5G/ InvisiWave versions available

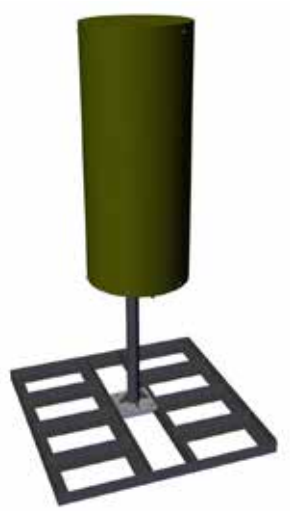
Raycap

Rooftop Solutions

Ballasted (non-penetrating) concealment pods are a great solution for disguising rooftop antennas. The ballasted pods are comprised of a steel frame, center mast pipe, steel clamp-on bulkheads and a radome. These standard frames allow for reduced engineering cost and lead time plus the optimized framing material makes manufacturing and installation a breeze.

Ballasted Pods

- 5G InvisiWave version available
- Does not require roof penetrations
- Can be used as temporary solution
- Easily to assemble and install



Rooftop Pods / Cupolas / Wall Mounted Solutions Gallery

AC Disconnects

The RSCAC and RSx-Series are 120/240 VAC industry standard load centers and surge protection devices that are suitable for use as service equipment (SUSE) with NO conditions per UL and NEC. They are designed to provide robust overvoltage surge protection for the AC power circuits for today's small cell radio systems. They employ patented Strikesorb® 30-A-2CHV modules capable of withstanding direct surge currents up to 5kA (10/350 µs) and induced surge currents up to 60 kA (8/20 µs). These products provide dual (Line 1 to Neutral) (Line 2 to Neutral) protection for up to sixteen AC circuits depending on the model.

Common and Standard Features

- Suitable for use as Service Equipment SUSE with NO condition per UL and NEC
- 120/240 VAC, up to 100A installations
- Load breakers can be 2A - 25A rated (RSx-Series) or 15A and 20A Tandems (RSCAC-Series)
- Tightly integrated AC disconnect, AC distribution and AC surge protection in one cabinet
- Strikesorb Over Voltage Protection (OVP) on AC circuits
- Ruggedized industrial construction, most with top and bottom cable access for maximum flexibility and space-savings in small cell deployments
- Rigorous weatherproof enclosure options: NEMA 4 (for hose down/sprinkler protection), Nema 4x (for corrosive locations) and even NEMA 6/6p (IP68) for temporarily submerged locations like street hand holes
- Optional AC GFI protected outlet and/or various means of external diconnects available on some models

RSD-FMC-Z16MS-21NN
(16 Breakers, Strikesorb SPD, External Disconnect)

Raycap

AC Disconnects

RSCAC-1333 Series

- 60A main breaker
- 22kA Fault Current Rating (kAIC)
- 6x configurable tandem breakers provided (12 Loads)
  (Default is 6x 15A/15A tandem breakers. Custom breaker lists can be specified at the time of order.)
- Bottom cable-access
- 9”H x 9”W x 5”D
  NEMA 4X or IP 68 &
  NEMA 6/6P rated enclosure
- Versatile mounting bracket included

RSCAC-1333-P-240

RSCAC-1333-P-240-D
– Hinged-Cover
External Disconnect

RSCAC-1333-PH-240
– No-hinge front door for concealment or pole applications
– Submersion up to 1 meter for 30 minutes

RSCAC-9556 Series

- 100A main breaker
- 22kA Fault Current Rating (kAIC)
- 6x configurable tandem breakers provided (12 Loads)
  (Default is 6x 15A/15A tandem breakers. Custom breaker lists can be specified at the time of order.)
- Bottom cable-access
- 11”H x 9”W x 5”D
  NEMA 4X or IP 68 &
  NEMA 6/6P rated enclosure
- Versatile mounting bracket included

RSCAC-9556-P-240

RSCAC-9556-P-240-D
– Hinged-Cover
External Disconnect

RSCAC-9556-PH-240
– No-hinge front door for concealment or pole applications
– Submersion up to 1 meter for 30 minutes

RSCAC-9550 Series

- 60A main breaker
- 22kA Fault Current Rating (kAIC)
- 6x configurable tandem breakers provided (12 Loads)
  (Default is 6x 15A/15A tandem breakers. Custom breaker lists can be specified at the time of order.)
- Top & Bottom cable-access
- 11”H x 9”W x 5”D
  NEMA 4X or IP 68 &
  NEMA 6/6P rated enclosure
- Versatile mounting bracket included

RSCAC-9550-P-240

RSCAC-9550-P-240-D
– Hinged-Cover
External Disconnect

RSCAC-9550-PH-240
– No-hinge front door for concealment or pole applications
– Submersion up to 1 meter for 30 minutes

AC Disconnects

RSCAC-7038 Series

- 100A main breaker
- 10kAIC System Rating (due to GFI)
- 6x configurable tandem breakers provided (12 Loads)
  (Default is 6x 15A/15A tandem breakers. Custom breaker lists can be specified at the time of order.)
- Top & Bottom cable-access
- 14”H x 9”W x 5”D
  NEMA 4 rated enclosure
- GFI Convenience Outlet

RSCAC-7038-P-240

RSCAC-7038-P-240-D
– Hinged-Cover
External Disconnect

RSCAC-7239 Series

- 100A main breaker
- 22kAIC System Rating
- 6x configurable tandem breakers provided (12 Loads)
  (Default is 6x 15A/15A tandem breakers. Custom breaker lists can be specified at the time of order.)
- Top & Bottom cable-access
- 14”H x 9”W x 5”D
  NEMA 4 rated enclosure

RSCAC-7239-P-240

RSCAC-7239-P-240-D
– Hinged-Cover
External Disconnect

RSCAC-1440-P-240

- 60A main breaker
- DC power supply capable of providing up to 2 x 600 Watts at -54VDC
- (2) 15A DC outputs
- Passive or active cooling
- Indicator LEDs for
  AC available (1) and
  DC available (2)
- NEMA 3R rated enclosure suitable for outdoor
- Field retrofitable from 1 PSU to 2

AC Disconnects

RSx-F Series

- 16x configurable breakers provided (Load breaker list [ampacities and quantities - total 16] to be specified at the time of order.)
- 60A or 100A Main Breaker
- 10kA Fault Current Rating (kAIC)
- Top, bottom and side cable/conduit access
- 18.5"H x 9"W x 6"D NEMA 4 powder-coated enclosure, available in many colors
- Versatile mounting bracket included

RSD-FMC-Z16MS-21NN
(16 Breakers, Strikesorb SPD, External Disconnect)

Model Number Configuration

RSa-FMb-c16MS-21NN

a: RAL color		
D		= Light Gray / RAL7047
G		= Green / RAL6012
B		= Black / RAL9011
N		= Brown / RAL5022
L		= Blue / RAL5005

b: LED & Ext. Disconnect	
N	= None
L	= Light and External Disconnect

c: Main Breaker	
X	= 60A Main Breaker
Z	= 100A Main Breaker

AC Disconnect Options

	Clolor Options		No External Disconnect	With External Disconnect & Status Light
60A Main Breaker	Light Gray / RAL7047		**RSD-FMN-X16MS-21NN**	**RSD-FML-X16MS-21NN**
	Green / RAL6012		**RSG-FMN-X16MS-21NN**	**RSG-FML-X16MS-21NN**
	Black / RAL9011		**RSB-FMN-X16MS-21NN**	**RSB-FML-X16MS-21NN**
	Brown / RAL5022		**RSN-FMN-X16MS-21NN**	**RSN-FML-X16MS-21NN**
	Blue / RAL5005		**RSL-FMN-X16MS-21NN**	**RSL-FML-X16MS-21NN**
100A Main Breaker	Light Gray / RAL7047		**RSD-FMN-Z16MS-21NN**	**RSD-FML-Z16MS-21NN**
	Green / RAL6012		**RSG-FMN-Z16MS-21NN**	**RSG-FML-Z16MS-21NN**
	Black / RAL9011		**RSB-FMN-Z16MS-21NN**	**RSB-FML-Z16MS-21NN**
	Brown / RAL5022		**RSN-FMN-Z16MS-21NN**	**RSN-FML-Z16MS-21NN**
	Blue / RAL5005		**RSL-FMN-Z16MS-21NN**	**RSL-FML-Z16MS-21NN**

AC Disconnects

Common and Standard Features

- Suitable as Service Equipment (SUSE) with NO condition per UL and NEC
- 60A or 100A Main Breaker
- 120/240 VAC
- Up to 16 circuits available
- Strikesorb 2CHV SPD (L1-N, L2-N)
- Metallic enclosure, NEMA 4
- 9"W x 6"D (Ht depends on Bkrs)
- Versatile mounting bracket included

RSx-D Series

- 60A or 100A Main Breaker, 10kAIC
- NEMA 4 rated Powder Coated Steel enclosure
- Top, btm, side cable-access
- Can ship with Qty=2 to 10 Bkrs

RSD-DMN-X10MS-21NN

RSD-DML-X10MS-21NN
– Hinged-Cover External Disconnect

RSD-DML-Z16MS-21NN
(Lt. Gray color, 10 Breakers, Strikesorb SPD, External Disconnect)

RSx-E Series

- 60A or 100A Main Breaker, 10kAIC
- NEMA 4 rated Powder Coated Steel enclosure
- Top, btm, side cable-access
- Can ship with Qty=2 to 12 Bkrs

RSD-EMN-Z12MS-21NN

RSD-EML-Z12MS-21NN
– Hinged-Cover External Disconnect

RSD-EML-Z12MS-21NN
(Lt. Gray color, 10 Breakers, Strikesorb SPD, External Disconnect)

Fiber Management

Raycap offers pole or wall mount fiber enclosures for indoor and outdoor use. They are specifically designed for fast deployment and easy customer connection, providing the ultimate flexibility and optimal fiber organization.

Common and Standard Features

- Lightweight design
- IP65 sealing rate
- Minimum bending radius protection 30mm
- Customized configuration capacity available
- Allows integration of passive optical components
- Wall and pole mounted
- UV stable material for outdoor above ground use
- Passive convection cooling
- The standard kit contents include wall mounting brackets and splice protector sleeves
- Optional installation of 6 PLC splitters* (PLC splitters are pre-connectorized only on the outputs.) Customization available

RTF-8028

- Splicing capacity of 8 fibers

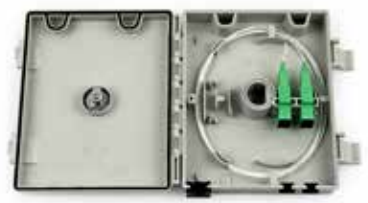
RTF-3392

- Splicing capacity of 16 fibers

Fiber Management

RTF-5238
- Splicing capacity of 6 fibers

RTF-3018
- Splicing capacity of 2 fibers



RTF-7054
- Splicing capacity of 4 fibers

RTF-3116
- Splicing capacity of 12 fibers

RTF-8818
- Splicing capacity of 24 fibers

Multi-Fiber Cables
(OMCS-GY-xx-yy-LCLC-zzzM)
- Dielectric rodent protected
- Low smoke, halogen free (FR LSZH) outer sheath
- Connectors:
  RRH side: Duplex LC
  BBU side: Duplex LC

Single Mode / Multi Mode Cables
(Duplex Patch cords)
- 0.9/1.8/2.0/3.0mm versions available
- Low loss connectors
- LSZH jacket
- RoHS compliant
- Different boot lengths available

Notes

Raycap Worldwide Locations

Raycap Inc.
806 South Clearwater Loop
Post Falls, ID 83854
United States of America

7555-A Palmetto Commerce Pkwy
North Charleston, SC 29420
United States of America

Raycap | Apelio
46 Sellers Street
Kearny, NJ 07032
United States of America

Raycap GmbH
Parkring 11
85748 Garching Munich
Germany

Raycap S.A.
Telou & Petroutsou 14
15124 Maroussi Athens
Greece

Raycap S.A. Manufacturing
Industrial Area of Drama
66100 Drama
Greece

Raycap d.o.o.
Poslovna cona Žeje pri Komendi
Pod hrasti 7
1218 Komenda
Slovenia

Raycap Cyprus Ltd.
46 Lefkosias Street
Industrial Area of Dali
2540 Nicosia
Cyprus

Raycap SAS
84 rue Charles Michels
Building B
93200 Saint-Denis
France

Raycap Corporation SRL
4A, Johann Strauss, 4 Floor,
Sector 2, 020312 Bucharest
Romania

Raycap (Suzhou) Co. Ltd.
Block B, Phase II
of New Sea Union
No. 58 Heshun Road
SIP, Suzhou 215122
Jiangsu Province
China

Raycap

raycap.com
info@raycap.com

G09-00-147 200207