



400W C-Band, 1:1 Redundant System in the 4RU chassis, with optional N+1 redundant power supplies



1.1 kW C-Band, 1:1 Redundant System in the 6RU Chassis



200W Ku-Band 1:1 Redundant System in the 3RU Chassis, with optional N+1 redundant power supplies

DESCRIPTION

Paradise Datacom's Indoor Rack Mount (-RM) series of redundant amplifier systems provide the highest degree of earth station redundancy and reliability.

These systems can be configured in either 1:1 or 1:2 redundant configurations using any of the Paradise Datacom family of Indoor Rack Mount SSPAs.

The RCP2-1100/1200 System Controller front panel mimic display shows the current switch positions and the on-line amplifiers. Dedicated fault lights provide easy indication of system status.

All RCP2-1100/1200 monitor and control is available locally, at the front panel LCD display, as well as remotely by the RS232 or RS485 interface ports.

FEATURES

- System Output Power to:
 - 1.1 kW S-Band
 - 1.1 kW C-Band
 - 1.0 kW X-Band
 - 500 W Ku Band
- Universal Input, Power Factor Corrected Power Supply
- Output Power Monitoring
- Separate 1 RU Redundant Controller for 1:2 systems
- Controller-less solutions for 1:1 systems

OPTIONS

- Controller-less 1:2 System
- Reflected Power Alarm
- L-Band Input operation
- Cold Standby Amplifier Operation
- External Exhaust Air Ducting Kit
- Custom Configurations



3 RU SSPA Chassis Output Power Levels

S-Band: 50W - 300W
 C-Band: 25W - 300W
 X-Band: 60W - 200W
 Ku-Band: 10W - 200W

3 RU Chassis includes integral AC-DC power supply



4 RU SSPA Chassis Output Power Levels

S-Band: 50W - 500W
 C-Band: 50W - 600W
 X-Band: 60W - 500W
 Ku-Band: 25W - 250W

4 RU Chassis includes integral AC-DC power supply

6 RU SSPA Chassis Output Power Levels

S-Band: 1.1 kW
 C-Band: 750W - 1.1 kW
 X-Band: 700W - 1.0 kW
 Ku-Band: 400W - 500W

6 RU Chassis uses separate, 3RU, power supply chassis.

Power Supply is a redundant, N+1, chassis.

Only 2 of 3 modules required to operate the SSPA with 1 hot standby.

Power Supply modules are front panel hot swappable.



Redundant Systems

Indoor Packaged SSPAs

3RU, 4RU & 6RU

Common System Specifications

Gain	minimum	70	dB
Gain Flatness	full band (except Extended C-Band)	±1.0	dB
	Extended C-Band units	±1.5	dB
Gain Slope	per 40 MHz (C-,X-,Ku-bands)	±0.3	dB/40 MHz
	per 10 MHz (S-band)	±0.1	dB/10 MHz
Gain Variation vs. Temperature	0°C to +50°C	±1.0	dB
Gain Adjustment	0.1 dB resolution	20	dB
Intermodulation Distortion	3dB back off relative to P _{1dB}	-25	dBc
AM/PM Conversion	(@ rated P _{1dB})	3.5	°/dB
	(@P _{1dB} -3dB)	0.5	°/dB
Spurious Harmonics	(@ rated P _{1dB})	-60	dBc
	(@ rated P _{1dB,3dB})(C-,X-,Ku-bands)	-50	dBc
	(@ rated P _{1dB,3dB}) (S-band)	-40	dBc
Input / Output VSWR	All units except Extended C-Band	1.30:1	
	Extended C-Band units	1.50:1	
Noise Figure	at maximum gain	12	dB
Group Delay (per 40 MHz segment)	Linear	0.01	ns/MHz
	Parabolic	0.003	ns/MHz ²
	Ripple	1.0	ns p-p
Noise Output	TX Band (S-,C-,X- or Ku-bands)	-70	dBW/4 KHz
	RX Band (C- or Ku-bands)	-155	dBW/4 KHz
	RX Band (X-band)	-100	dBW/4 KHz
	RX Band (S-band)	(see below)	
Residual AM Noise	0 - 10 KHz	-45	dBc
	10 KHz - 500 KHz	-20 (1.25 + log F)	dBc
	500 KHz - 1 MHz	-80	dBc
Residual Phase Noise	Offset frequency from carrier		
	10 Hz	-90	dBc/Hz
	100 Hz	-100	dBc/Hz
	1 kHz	-110	dBc/Hz
	10 kHz	-120	dBc/Hz
	100 kHz	-125	dBc/Hz
	1 MHz	-130	dBc/Hz

Mechanical

Size - 3 RU Chassis	width X height X depth	19.0 X 5.22 X 24.13	inches
		483 X 133 X 613	mm
Size - 4 RU Chassis	width X height X depth	19.0 X 7.0 X 28.0	inches
		483 X 178 X 711	mm
Size - 6 RU Chassis	width X height X depth	19.0 X 10.47 X 30.0	inches
		483 X 266 X 762	mm
Power Supply Chassis	width X height X depth	19.0 X 5.25 X 15.44	inches
		483 X 134 X 433	mm
Weight - 3 RU Chassis	≤ 200W Chassis	75 (34)	lbs. (kg)
Weight - 3 RU Chassis	> 200W Chassis	100 (45)	lbs. (kg)
Weight - 4 RU Chassis	≤ 250W Chassis	75 (34)	lbs. (kg)
Weight - 4 RU Chassis	> 250W Chassis	100 (45)	lbs. (kg)
Weight - 6 RU Chassis		180 (82)	lbs. (kg)
Weight - Power Supply Chassis		50 (23)	lbs. (kg)
Finish		powder coat	Gray

Environmental

Operating Temperature	Ambient	0 to +50	°C
Relative Humidity	Condensing	95	%
Cooling System	Integrated	Forced air	

S-Band Receive Band Noise and Filter Option

Receive Band Reject Filter	Insertion Loss	-0.3	dB
<i>Filter integrated into SSPA chassis through 400W output; ≥500W SSPAs require external filter</i>	Rx Reject @ 2.200 - 2.300 GHz	-60	dBc
	Rx Reject @ 2.025 - 2.120 GHz	-60	dBc
Receive Band Noise Power Density	Without optional filter	-95	dBW/4 KHz
	With optional filter	-155	dBW/4 KHz

L-Band Operation

Paradise Datacom offers C-, X-, and Ku-Band amplifiers with an integrated L-Band Block Up Converter. The L-Band units utilize Paradise Datacom's proprietary ZBUC™ technology. The addition of a ZBUC™ to a Rack Mountable SSPA system typically increases the gain by 2-4 dB. The advantages of ZBUC™ technology include:

- ZBUC™ can detect and switch to an externally supplied reference.
- Optional internal high stability (10MHz) reference.
- ZBUC™ can lock to an externally supplied reference of 5, 10, 20, 25, or 50 MHz without modification.
- ZBUC™ can accept a wide range of external reference power (-10dBm to +5 dBm)
- ZBUC™ can accept FSK monitor and control signal via the IFL for complete amplifier remote control.

Available Frequency Plans

Band	Frequency Band	IF Input	LO Frequency	RF Output	Gain Change
C	Standard C-Band	950 - 1525 MHz	4.900 GHz	5.850 - 6.425 GHz	0-4 dB
C	Extended C-Band	950 - 1825 MHz	4.900 GHz	5.850 - 6.725 GHz	0-4 dB
C	Palapa Band	950 - 1250 MHz	5.475 GHz	6.425 - 6.725 GHz	0-4 dB
C	Insat Band	950 - 1250 MHz	5.775 GHz	6.725 - 7.025 GHz	0-4 dB
C	Extended C-Band 2	950 - 1675 MHz	4.800 GHz	5.750 - 6.475 GHz	0-4 dB
X	Standard X-Band	950 - 1450 MHz	6.950 GHz	7.900 - 8.400 GHz	0-2 dB
Ku	Standard Ku-Band	950 - 1450 MHz	13.050 GHz	14.00 - 14.50 GHz	0-2 dB
Ku	Extended Ku-Band	950 - 1700 MHz	12.800 GHz	13.75 - 14.50 GHz	0-2 dB

Electrical Specifications for RM SSPA System with ZBUC™

PARAMETER	NOTES	LIMITS				UNITS	
Gain	Nominal setting	75				dB	
Gain Flatness	full band (C-,X-,Ku-bands)	±2.0				dB	
Gain Slope	per 40 MHz (C-,X-,Ku-bands)	±0.5				dB/40 MHz	
Gain Adjusted Range		20				dB	
	Typical C-Band Adj. Range	60 - 80				dB	
	Typical Ku-Band Adj. Range	57 - 77				dB	
Gain Stability	-40 to +60 °C	±1.5				dB	
Phase Noise	Offset frequency from carrier	<u>Absolute max.</u>	<u>C-band (typ.)</u>	<u>X-band (typ.)</u>	<u>Ku-band (typ.)</u>		
	10 Hz	-30	-60	-60	-50	dBc/Hz	
	100 Hz	-60	-80	-75	-65	dBc/Hz	
	1 KHz	-70	-80	-75	-72	dBc/Hz	
	10 KHz	-80	-85	-100	-90	dBc/Hz	
	100 KHz	-90	-120	-110	-110	dBc/Hz	
	1 MHz	-90	-125	-122	-120	dBc/Hz	
Spurious	In-Band Signal Related (C-/Ku-Band)					-50	dBc
	(Extended C-Band)					-40	dBc
	Close to Carrier Spurious (≤ 20 MHz)					-50	dBc
	Local Oscillator					-30	dBm
	Non-Signal Related					-40	dBm
Noise Figure	At 75 dB gain setting					20	dB
Input VSWR	L-Band					1.5 : 1	
Internal Reference Option	Reference accuracy @ 25 °C					±1 • 10 ⁻⁸	
	Reference Stability over Temperature (-40 to +40 °C)					±1 • 10 ⁻⁹	

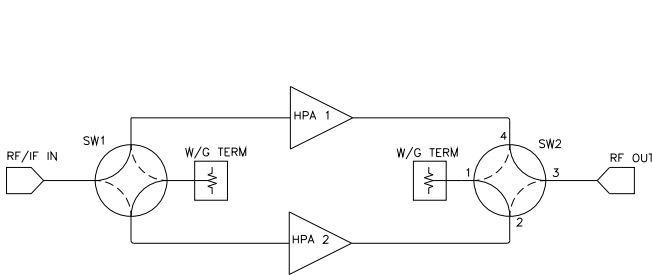
Indoor Redundant System Physical Configurations



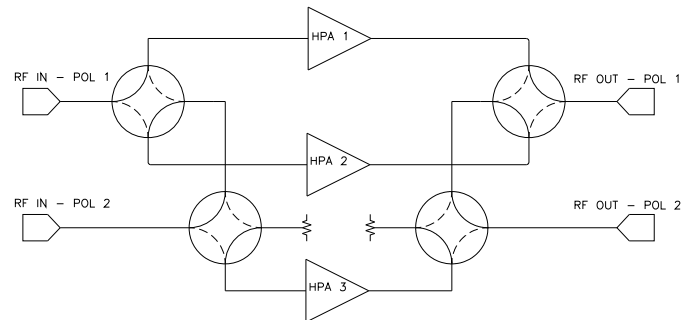
Optional 1RU Remote Control Panels



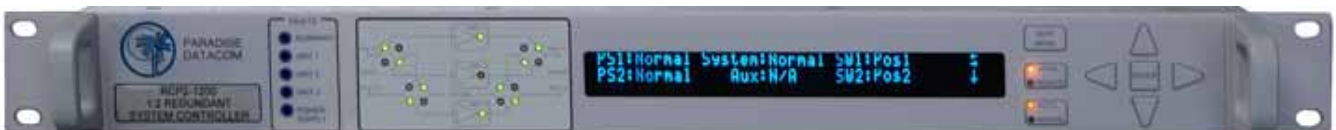
RCP2-1100 1:1 Redundant Controller



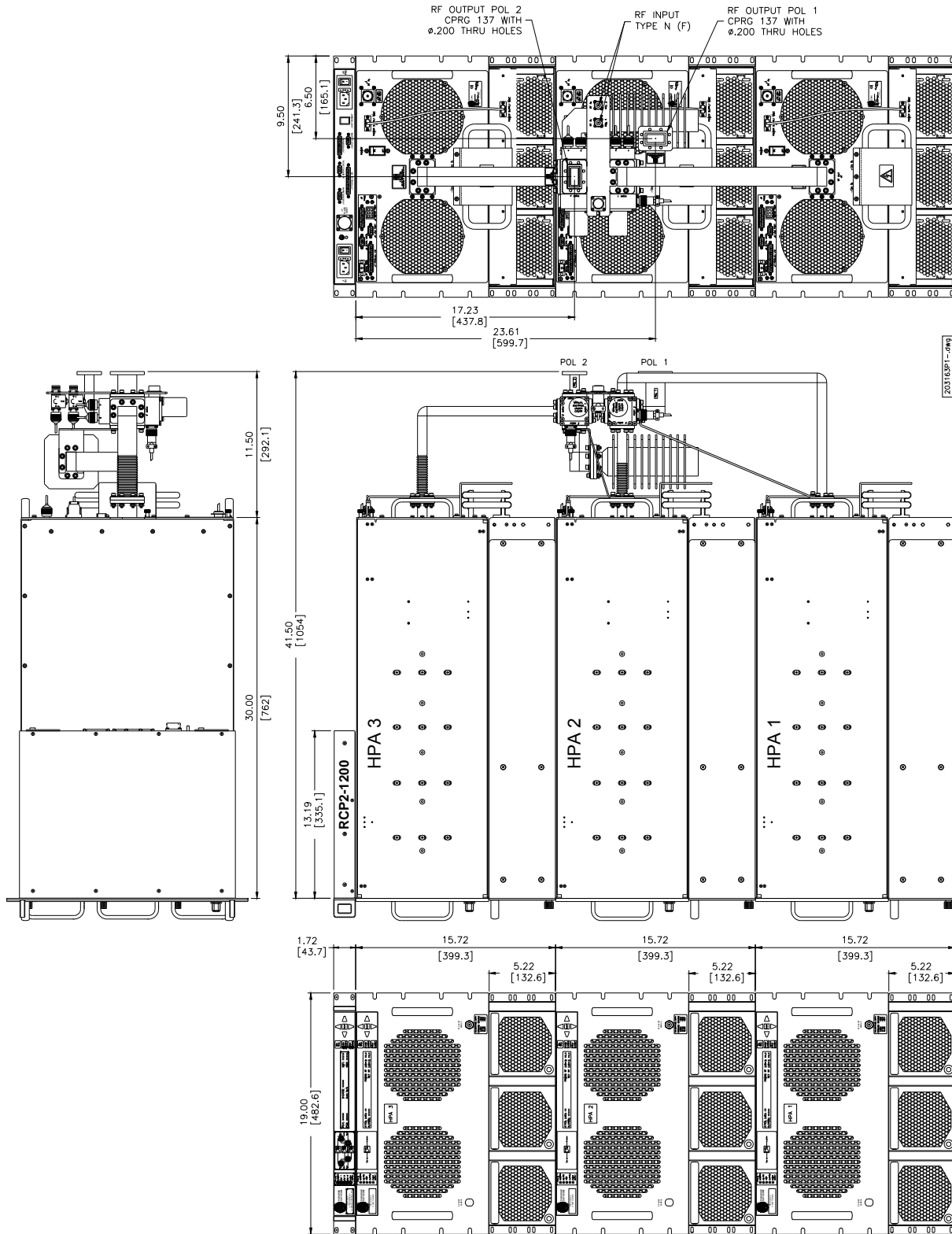
Block Diagram, 1:1 Redundant System



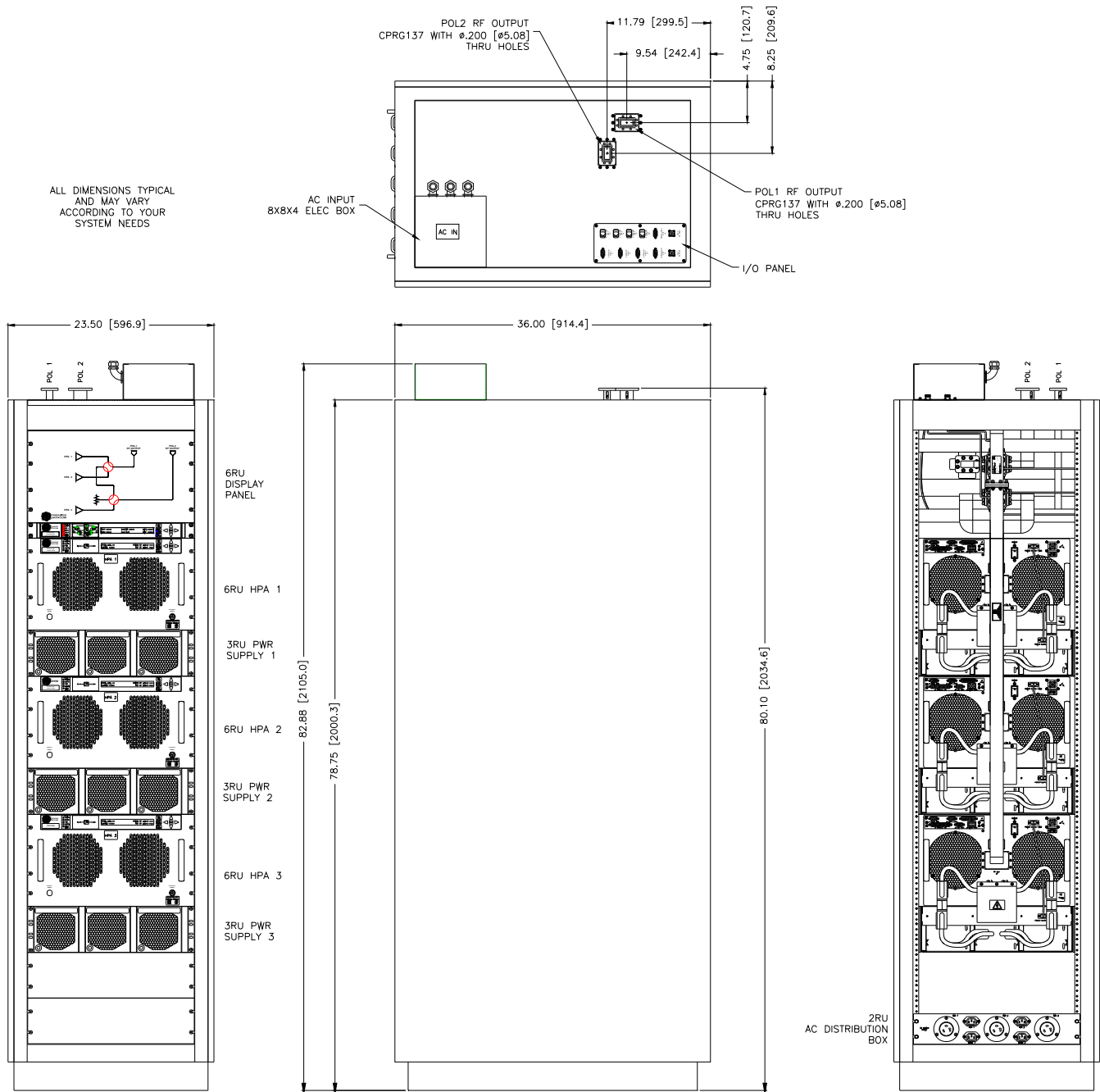
Block Diagram, 1:2 Redundant System



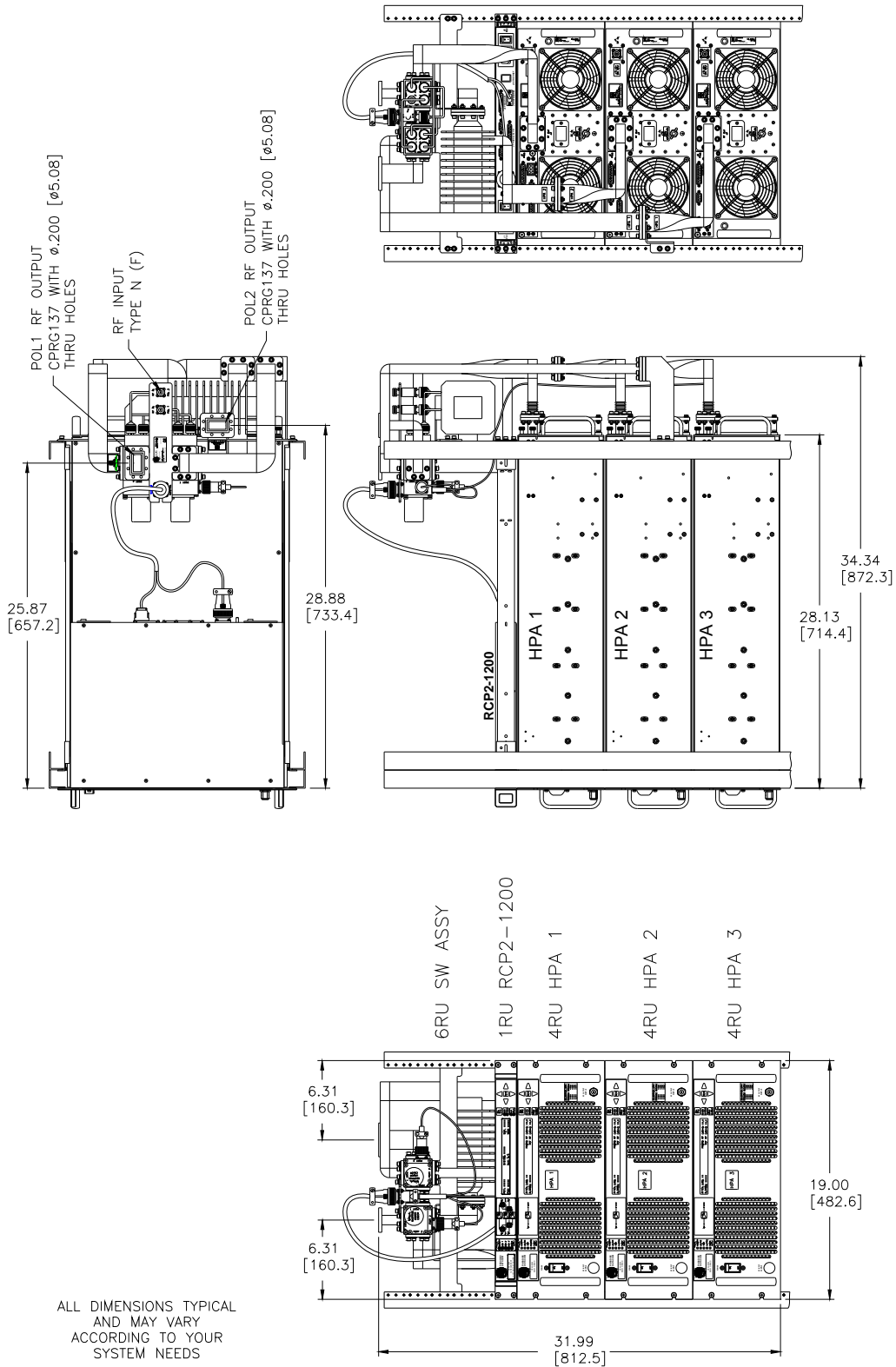
RCP2-1200 1:2 Redundant Controller



Outline Drawing, 1:2 Redundant System, C-Band, using 6RU SSPAs and 3RU Power Supplies, with RCP2-1200 and Rear Mounted Waveguide Switching, Cabinet not included

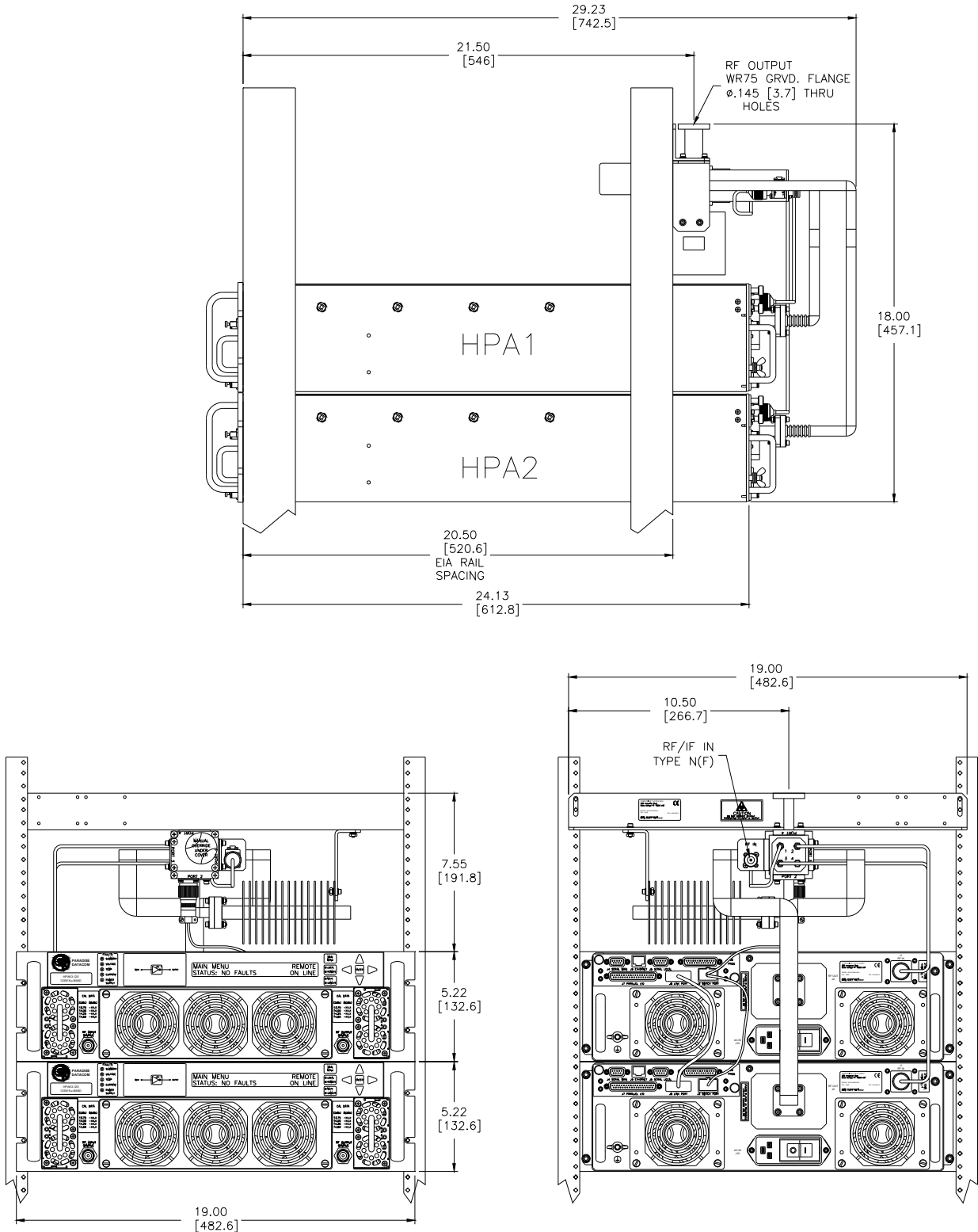


Outline Drawing, 1:2 Redundant System, C-Band, using 6RU SSPAs and 3RU Power Supplies, with RCP2-1200 and Top Mounted Waveguide Switching with Cabinet

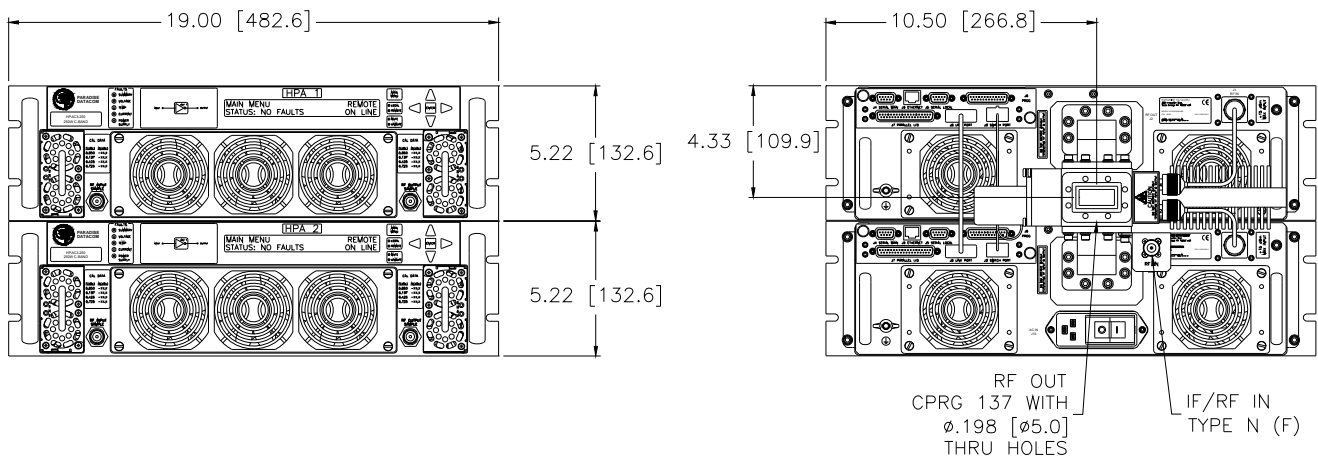
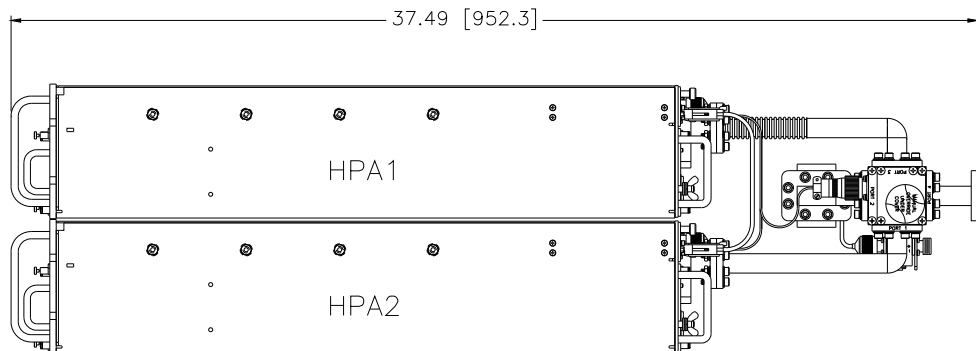
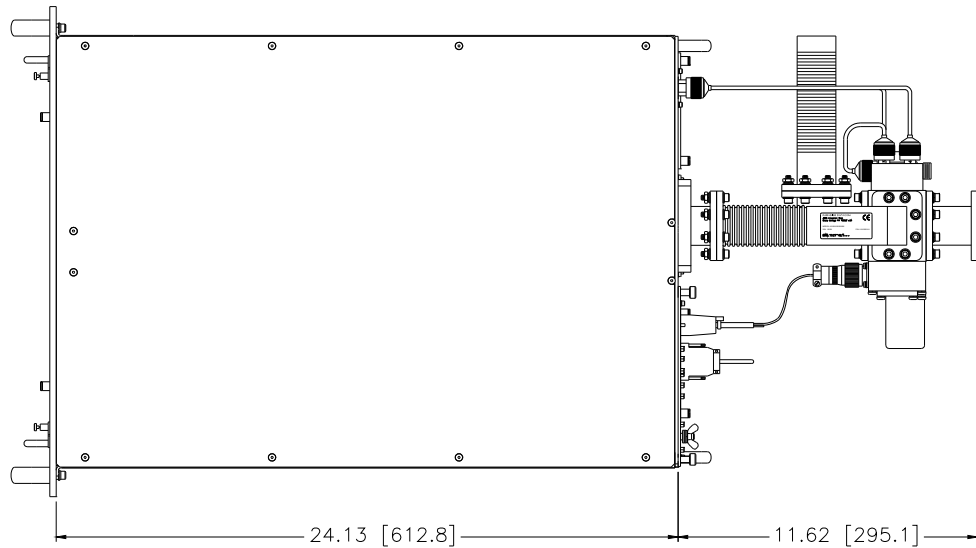


ALL DIMENSIONS TYPICAL
AND MAY VARY
ACCORDING TO YOUR
SYSTEM NEEDS

**Outline Drawing, 1:2 Redundant System, C-Band, using 4RU SSPAs,
with Top Mounted Waveguide Switching, Cabinet not included**



**Outline Drawing, 1:1 Redundant System, Ku-Band, using 3RU SSPAs,
with Top Mounted Waveguide Switching, Cabinet not included**



**Outline Drawing, 1:1 Redundant System, C-Band, using 3RU SSPAs,
with Rear Mounted Waveguide Switching, Cabinet not included**

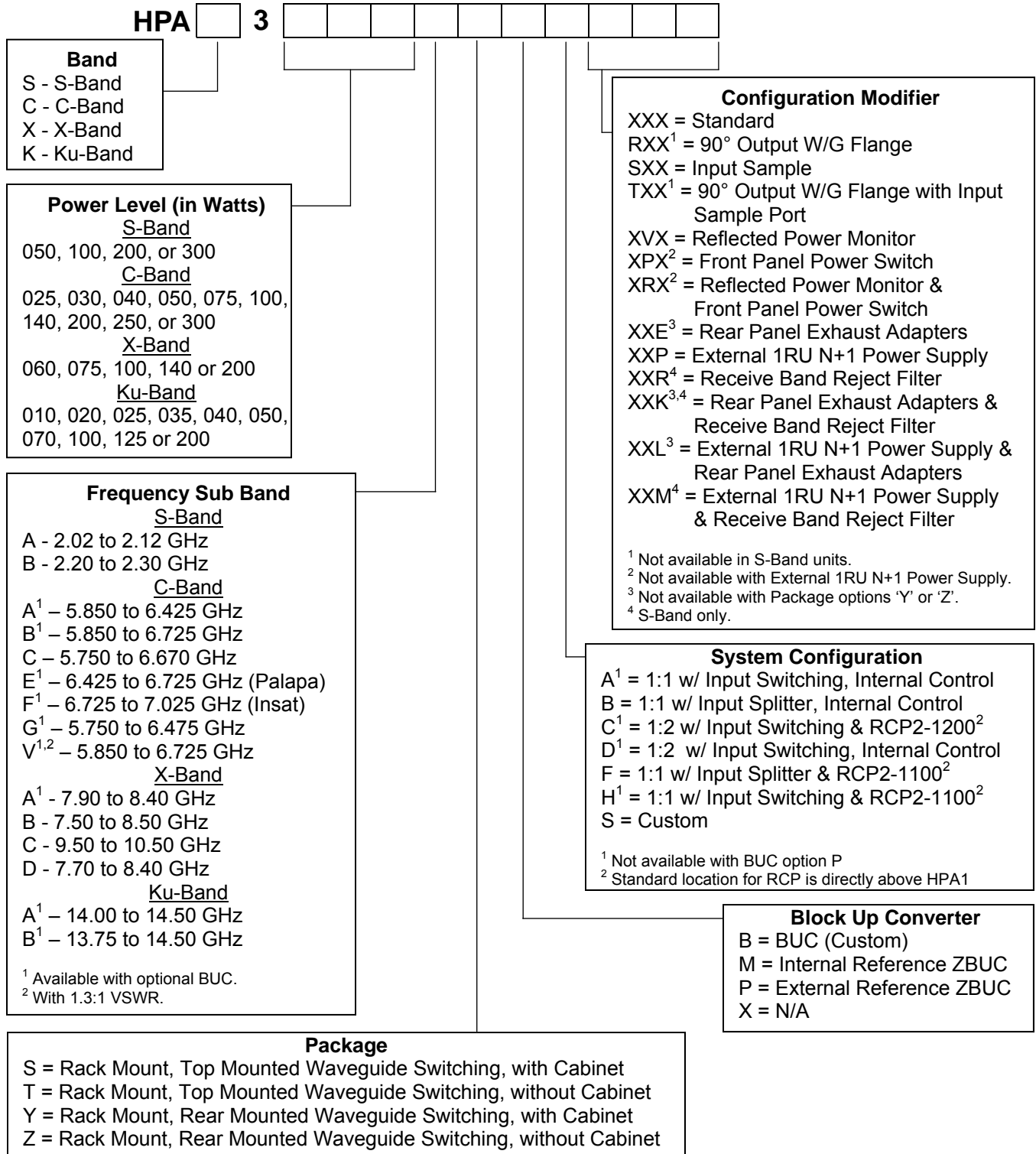


Redundant Systems

Indoor Packaged SSPAs

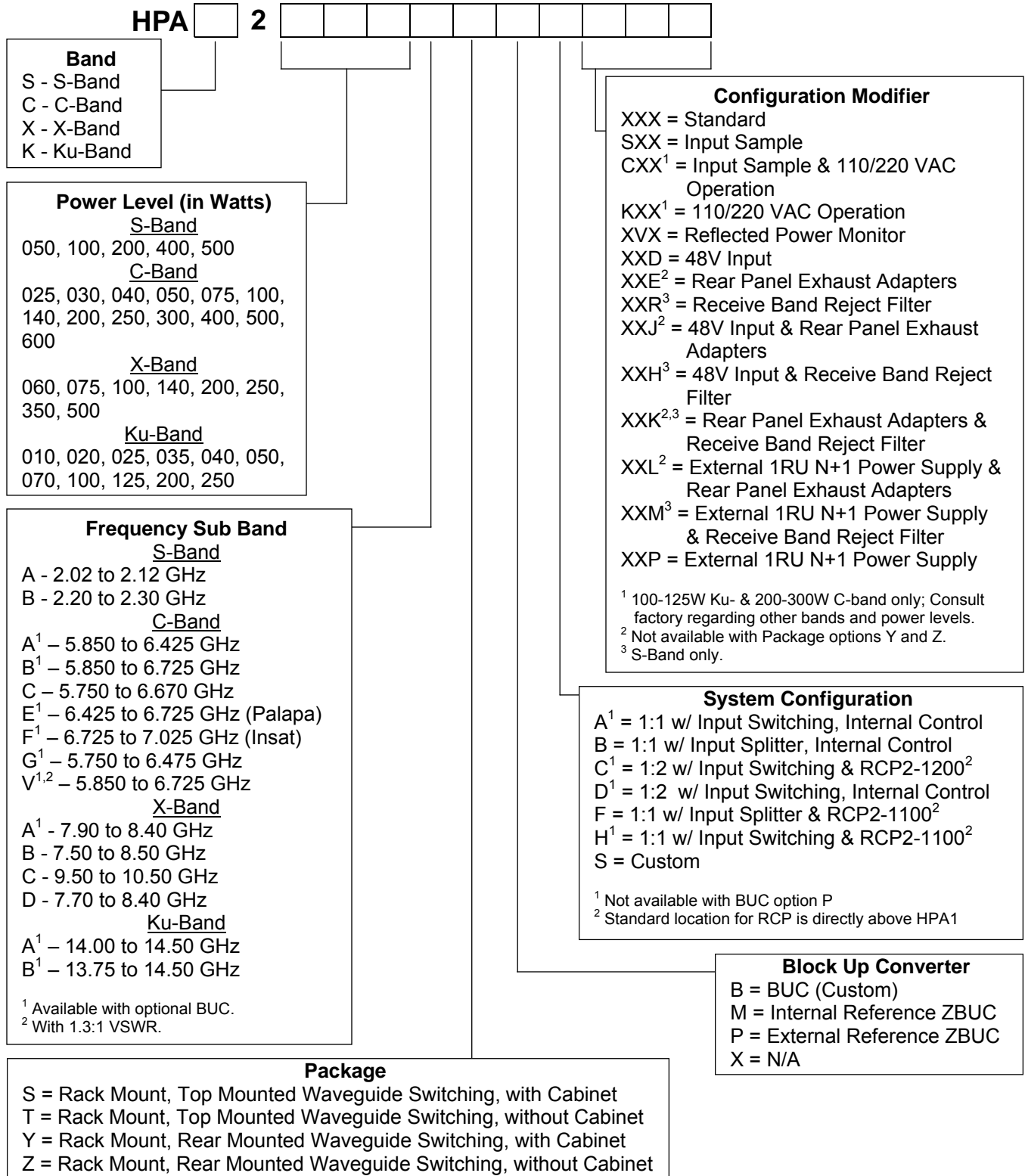
3RU, 4RU & 6RU

Part Number Configuration, 3 RU Chassis



Specifications in this document are subject to change.

Part Number Configuration, 4 RU Chassis



Specifications in this document are subject to change.

Part Number Configuration, 6 RU Chassis

HPA 6

Band
 S - S-Band
 C - C-Band
 X - X-Band
 K - Ku-Band

Power Level (in Watts)
S-Band
 1100 (11K)
C-Band
 750, 1100 (11K)
X-Band
 700, 1000 (10K)
Ku-Band
 400, 500

Frequency Sub Band
S-Band
 A - 2.02 to 2.12 GHz
 B - 2.20 to 2.30 GHz
C-Band
 A¹ - 5.850 to 6.425 GHz
 B¹ - 5.850 to 6.725 GHz
 C - 5.750 to 6.670 GHz
 E¹ - 6.425 to 6.725 GHz (Palapa)
 F¹ - 6.725 to 7.025 GHz (Insat)
 G¹ - 5.750 to 6.475 GHz
 V^{1,2} - 5.850 to 6.725 GHz
X-Band
 A¹ - 7.90 to 8.40 GHz
 B - 7.50 to 8.50 GHz
 C - 9.50 to 10.50 GHz
 D - 7.70 to 8.40 GHz
Ku-Band
 A¹ - 14.00 to 14.50 GHz
 B¹ - 13.75 to 14.50 GHz

¹ Available with optional BUC.
² With 1.3:1 VSWR.

Package
 S = Rack Mount, Top Mounted Waveguide Switching, with Cabinet
 T = Rack Mount, Top Mounted Waveguide Switching, without Cabinet
 Y = Rack Mount, Rear Mounted Waveguide Switching, with Cabinet
 Z = Rack Mount, Rear Mounted Waveguide Switching, without Cabinet

Configuration Modifier
 XXX = Standard
 DXX¹ = Non-redundant 1RU Power Supply
 EXX¹ = Non-redundant 1RU Power Supply & Input Sample Port
 FXX = (2) 1RU Power Supplies, Non-redundant²
 GXX = (2) 1RU Power Supplies, Non-redundant² & Input Sample
 HXX = (2) 1RU Power Supplies, Redundant
 JXX = (2) 1RU Power Supplies, Redundant & Input Sample Port
 SXX = Input Sample Port
 VX = Reflected Power Monitor
 XXE³ = Rear Panel Exhaust Adapters

¹ Only available with 750W C-Band; 400W Ku-Band.
² Redundant with 750W C-Band; 400W Ku-Band.
³ Not available with Package options Y or Z.

System Configuration
 S = Custom
 A¹ = 1:1 System w/ Input Switching
 B = 1:1 System w/ Input Splitter
 C¹ = 1:2 System w/ Input Switching & RCP2-1200²
 D¹ = 1:2 System w/ Input Switching, Internal Redundancy Control
 F = 1:1 System w/ Input Splitter & RCP2-1100²
 H¹ = 1:1 System w/ Input Switching & RCP2-1100²

¹ Not available with BUC option P

Block Up Converter
 B = BUC (Custom)
 M = Internal Reference ZBUC
 P = External Reference ZBUC
 X = N/A

Specifications in this document are subject to change.