



## ALB200-C Series 400 W, C-Band Antenna Mount TWT

### Agilis ALB200-C Series 400 W, C-Band Antenna Mount TWT

The ALB200-C range of C-Band TWT amplifiers from Agilis provide over 350 W of output power in a compact, lightweight, rugged, weatherproof, antenna mount enclosure. The advanced packaging and cooling techniques enable the unit to operate in extreme environmental conditions from direct rain to direct sunlight. The amplifiers can be simply deployed anywhere in the world, are user-friendly, and incorporate a comprehensive remote control facility as standard, including RS485 and Ethernet options.

The HPA incorporates a high efficiency multi-collector TWT powered by an advanced power supply built on over 25 years of experience in the design and manufacture of satellite amplifiers. The company's products have an enviable reputation for performance, robust quality and reliable service. The ALB200-C is available with a wide range of options and accessories, backed by round-the-clock, worldwide technical support.

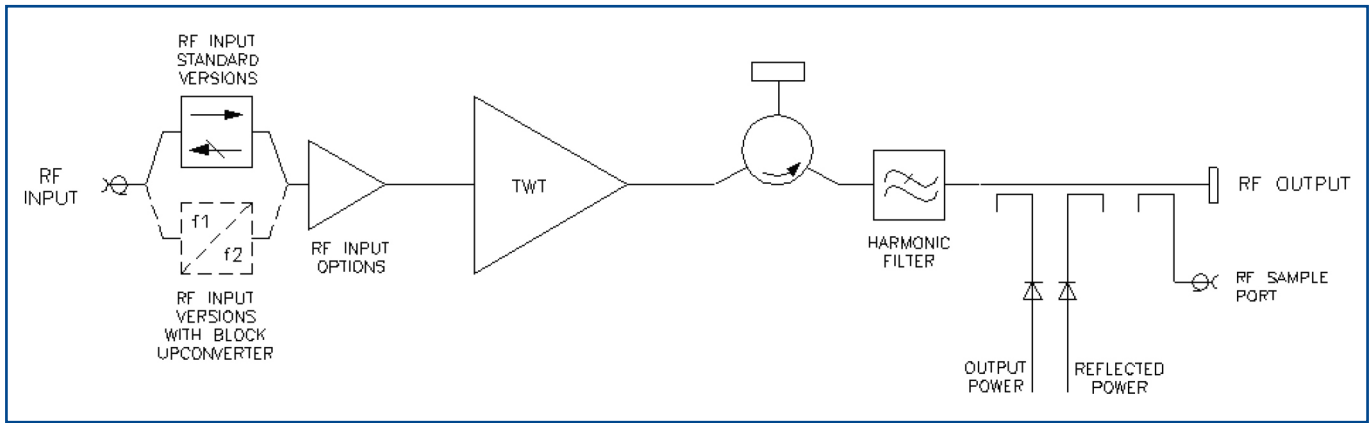
#### OPTIONS

- Integral solid-state amplifier (SSA)
- Gain control (requires SSA)
- L-band block upconverter
- Lineariser
- Break-out link for upconverter

#### FEATURES

- Advanced cooling design enables operation at +55 °C and in direct sunlight.
- Weatherproof antenna mount construction allows exposed mounting.
- CE compliant
- cETLus listed
- CB certified
- Wide input voltage range – can operate from mains supplies worldwide
- Redundant control – contains control and drive circuits for 1:1 redundancy
- Stand-alone setting – automatically sequences to transmit mode
- Round-the-clock hotline support
- Wide range of accessories including: controllers, waveguide networks, cable assemblies.

**BLOCK DIAGRAM**



**PERFORMANCE** (Without Upconverter)

|   |   |                     |
|---|---|---------------------|
| Frequency range:  |   |                     |
| standard – CC1  | 5.85 to 6.425                             | GHz                 |
| extended – CC2  | 5.85 to 6.65                              | GHz                 |
| Output power:   |   |                     |
| TWT output flange   | 400                                       | W min               |
| HPA rated output  | 350                                       | W min               |
| Gain:   |   |                     |
| at rated power (C option)                                   | 45  | dB min              |
| at rated power (A, D, Z option)                             | 70  | dB min              |
| SSG $P_{rated}$ –10 dB (C option)                           | 50  | dB min              |
| SSG $P_{rated}$ –10 dB (A, D, Z option)                     | 75  | dB min              |
| Attenuation range (D, Z option)                             | 25  | dB min              |
| Gain variation:   |   |                     |
| full band   | 2.5                                       | dB max              |
| over any 40 MHz band  | 1.0                                       | dB max              |
| slope   | 0.08                                      | dB/MHz max          |
| Gain stability 24hrs (constant drive, temperature and load) | 0.5                                       | dB max              |
| Gain stability over full operating temperature..            | 2.0 dB max                                |                     |
| Intermodulation (two equal carriers)                        |   |                     |
| with total output = $P_{rated}$ –4 dB:                      |   |                     |
| options C, A, D   | -18                                       | dBc max             |
| performance with linearised option, Z                       | -24                                       | dBc max             |
| Harmonic output   | -60                                       | dBc max             |
| AM to PM conversion at $P_{rated}$ –6 dB                    | 2.5                                       | %/dB                |
| Noise power:  |   |                     |
| transmit band   | -70                                       | dBW/4 kHz max       |
| receive band (3.2 – 4.2 GHz)                                | -150                                      | dBW/4 kHz max       |
| Residual AM:  |   |                     |
| <10 kHz   | -50                                       | dBc max             |
| 10 kHz < f < 500 kHz  | -20(1.5+log f)                            | dBc max             |
| >500 kHz  | -85                                       | dBc max             |
| Group delay:  |   |                     |
| linear  | 0.01                                      | ns/MHz              |
| parabolic   | 0.005                                     | ns/MHz <sup>2</sup> |
| ripple  | 0.5                                       | ns p-p              |
| Phase noise:  |   |                     |
| continuous  | 10 dB lower than IESS phase noise profile |                     |
| AC fundamental  | -50                                       | dBc                 |
| sum of all spurs  | -47                                       | dBc                 |
| Input VSWR (operating)                                      | 1.3:1                                     | max                 |
| Output VSWR (non-operating)                                 | 1.3:1                                     | max                 |
| Load VSWR, no damage  | 2.0:1                                     | max                 |

**ELECTRICAL**

|                   |   |
|-------------------|---|
| Prime power       | single phase, line-neutral or line-line |
| Voltage           | 99 to 265 V                             |
| Frequency         | 47 to 63 Hz                             |
| Power requirement | 1500 VA max                             |
| Power factor      | 0.95 min                                |

**MECHANICAL**

|            |                     |
|------------|---------------------|
| Weight     | 25.0 kg (55 lb) typ |
| Dimensions | see outline         |
| Cooling    | integral forced-air |

**CONNECTORS**

|                   |  |
|-------------------|--|
| RF input          | N-type female                            |
| RF output         | CPR137G with 10-32 UNF 2B threaded holes |
| RF sample port    | N-type female                            |
| Prime power       | ITT Cannon - CGL02A20-3P-E1B-B           |
| Control interface | .62GB-12E-2041-PN                        |

**Note:** Mating connectors for the mains supply and control interface are supplied.

**ENVIRONMENTAL**

|  |  |
|--|--|
| For operation outside these parameters, refer to <b>Agilis</b> for guidance. |  |
| Operating temperature (see note 1)   | -40 to +55 °C                                |
| Derating   | 2°C/300 m above sea level (3.6 °F/1000 ft)   |
| Solar gain   | 1120 W/m <sup>2</sup>                        |
| Storage temperature  | -40 to +80 °C                                |
| Relative humidity (condensing)   | 100 %  |
| Altitude:  |  |
| operating  | 4.5 km (15,000 ft) max                       |
| non-operating  | 12 km (40,000 ft) max                        |
| Vibration:   | BS EN 60068-2-64 test Fh, Transportation     |
| Shock:   | IEC Publication 68-2-27 Part 2 Test Ea, 25 g |
| EMC:   |  |
| EN61000-6-3:2001 (Emissions)   |  |
| EN61000-6-2:2001 (Immunity)  |  |
| FCC CFR47 Part 15B   |  |

**CE CERTIFIED**

EMC Directive 89/336/EEC, Low Voltage Directive 73/23/EEC.

**NOTES**

- +55 °C applies when the input supply voltage is between 180 and 265 V. Below 180 V, the maximum operating temperature is +50 °C.
- Safety applies for operating altitude up to 2000 m and operating temperature up to +50 °C.



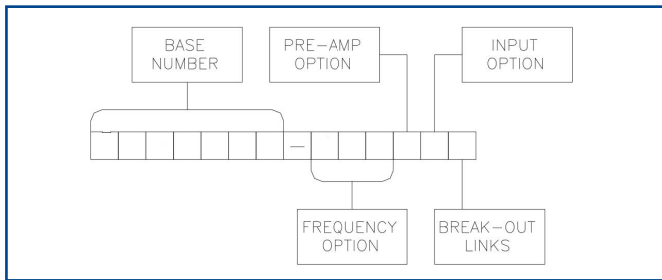
## CONTROLS

| TYPE                          | FUNCTION  |  |
|-------------------------------|---|--|
| REMOTE CONTROL                | Off<br>Standby<br>Transmit<br>RF Inhibit  | High Power Alarm Set*<br>Low Power Alarm Set*<br>Auto Redundancy Control*<br>RF Switch Control*<br>Gain Control* (when fitted)   |
| REMOTE STATUS/MONITOR         | Off<br>Warm-Up<br>Standby<br>Transmit<br>Fault Summary<br>Reflected Power<br>External Interlock<br>TWT Too Hot<br>Mean Helix Current<br>Peak Helix Current<br>High Power Alarm*<br>Low Power Alarm* | Output Power Monitor*<br>Reflected Power Monitor*<br>Helix Current Monitor*<br>Helix Voltage*<br>Collector Voltages*<br>Heater Voltage*<br>Heater Current*<br>Elapsed Hours* |
| INTERFACES:<br>Serial<br>User | RS-422/485<br>Dry Relay Contact   |  |
| Other Features                | Auxiliary Output Voltage<br>Redundant system & waveguide switch drive<br>'Stand Alone' setting for automatic power-up   |  |

**Note:** Controls/Monitoring marked\* are only available via Serial Interface.

### OPTIONS

Extensive options are offered with the **ALB200-C** and include; integral pre-amplifiers, gain control, linearisers and block upconverters. The options are defined by adding to the base number as shown below:



(Consult **Agilis** for availability of options).

#### Frequency Options

The **ALB200-C** is offered in two frequency bands:  
CC1 - 5.85 – 6.425 GHz  
CC2 - 5.85 – 6.65 GHz

#### Pre-Amp Option

The pre-amp option can be selected from any of the following:

- C - No pre-amp (typical SSG 52 dB).
- A - Integral solid-state amplifier (typical SSG 78 dB).
- D - As option 'A' but includes an attenuator to provide 25 dB (min.) of gain control.
- Z - Integral lineariser that improves the linearity of the HPA, providing a C/I of typically -26 dBc at 4 dB OPBO. The lineariser also incorporates the pre-amp and gain control options. (Consult **Agilis** for availability).

#### Input Option

The **ALB200-C** can be offered with an L-Band Block Upconverter. Specify:  
N - Standard RF  
U - L – C-Band Block Upconverter (see page 4)

**Note:** the upconverter requires the inclusion of either the 'D' or 'Z' options. (Consult **Agilis** for availability).

#### Break-Out Links

Available only with the upconverter option, this enables bypassing of the upconverter and can be used for monitoring, set-up, redundant switching etc. Specify 'S' for Break-Out Links (leave blank if not required).

#### ACCESSORIES

The **ALB200-C** is supplied with an operation manual, prime power connector mating part, interface connector mating part and air cowls. Additional accessories include:

- **Override Controller**  
Provides automatic power-up for 'emergency' situations.
- **1:1 Control Unit**  
Provides control of 2 HPA's in 1:1 switch configuration. (The waveguide switch network can also be supplied).
- **Cable Assemblies**  
For connecting **ALB200-C** to controllers and waveguide switches.
- Additional mains connector parts.
- Additional interface connector parts.

For more information on accessories, contact **Agilis**

**PERFORMANCE WITH INTEGRAL BLOCK UPCONVERTER**

|  |                    |
|--|--------------------|
| Output frequency range:  |                    |
| option CC1 .....   | 5.85 to 6.425 GHz  |
| option CC2 .....   | 5.85 to 6.65 GHz   |
| L-band input:  |                    |
| frequency range option CC1 .....   | 950 to 1525 MHz    |
| frequency range option CC2 .....   | 950 to 1750 MHz    |
| level .....  | 10 dBm max         |
| LO frequency (option CC1/CC2) .....  | 4.9 GHz            |
| External reference (see note):   |                    |
| frequency .....  | 10 MHz             |
| level .....  | -3 to +7 dBm       |
| impedance .....  | 50 Ω               |
| Output power:  |                    |
| TWT output flange .....  | 400 W min          |
| HPA rated output .....   | 350 W min          |
| Gain:  |                    |
| at rated power (D, Z option) .....   | 70 dB min          |
| SSG $P_{rated} - 10$ dB (D, Z option) .....                                  | 75 dB min          |
| Attenuation range (D, Z option) .....  | 25 dB min          |
| Gain variation:  |                    |
| full band .....  | 4.0 dB max         |
| over any 40 MHz band .....   | 1.5 dB max         |
| slope .....  | 0.08 dB/MHz max    |
| Gain stability 24hrs (constant drive, temperature and load).....             | 0.5 dB max         |
| Gain stability over full operating temperature.....                          | 2.0 dB max         |
| Intermodulation (two equal carriers) with total output = $P_{rated} - 4$ dB: |                    |
| options C, A, D .....  | -18 dBc max        |
| performance with linearised option, Z .....                                  | -24 dBc max        |
| Harmonic output .....  | 60 dBc max         |
| AM to PM conversion at $P_{rated} - 6$ dB .....                              | 2.5 %/dB           |
| Noise power:   |                    |
| transmit band .....  | -70 dBW/4 kHz max  |
| receive band (3.2 – 4.2 GHz) .....   | -150 dBW/4 kHz max |

|   |                                |                     |
|---|--------------------------------|---------------------|
| Residual AM >100 kHz from carrier ..... | -60                            | dBc max             |
| Group delay:                            |                                |                     |
| linear .....                            | 0.01                           | ns/MHz              |
| parabolic .....                         | 0.005                          | ns/MHz <sup>2</sup> |
| ripple .....                            | 0.5                            | ns p-p              |
| Phase noise:                            |                                |                     |
| Continuous .....                        | meets IESS phase noise profile |                     |
| AC fundamental .....                    | -50                            | dBc                 |
| Sum of all spurs .....                  | -47                            | dBc                 |
| Input VSWR (non-operating) .....        | 1.6:1                          | max                 |
| Output VSWR (non-operating) .....       | 1.3:1                          | max                 |
| Load VSWR, no damage .....              | 2.0:1                          | max                 |

**Note:** the BUC can be operated without the external reference, typical frequency stability  $\pm 0.25$  ppm.

**HEALTH AND SAFETY HAZARDS**

Agilis satellite amplifiers are safe to handle and operate provided that the relevant precautions are observed. Agilis does not accept responsibility for damage or injury resulting from the use of electronic devices it produces.

**High Voltage**

Dangerous voltages are present within the TWT amplifier when operating normally. However, the equipment is designed so that personnel cannot come into contact with high voltage circuits unless covers are removed.

**RF Radiation**

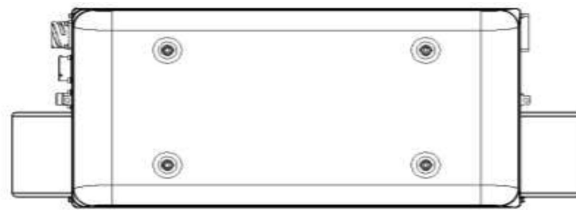
All RF connectors must be correctly fitted before operation.

**Beryllia**

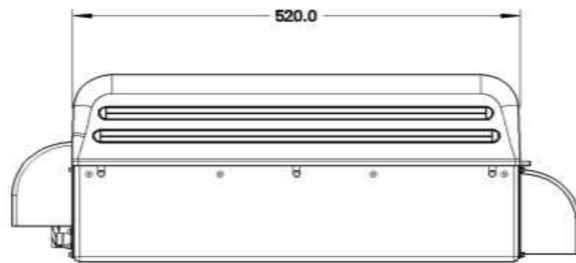
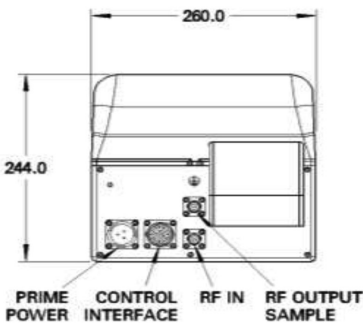
The TWT in the amplifier contains beryllium oxide ceramic parts. These are not accessible unless the TWT casing is damaged. Consult Agilis regarding the disposal of damaged or life-expired tubes.

**OUTLINE**

5229A



**Packed Gross Weight & Dimension**  
30.00kg 70x42x51cm



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Note: All specifications are subject to change without notice.  
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[www.agilissatcom.com](http://www.agilissatcom.com)

For more information, please send enquiry to:

**Singapore (Headquarters)**  
mktg\_satcoms@stee.stengg.com

**USA**  
usa\_satcoms@stee.stengg.com

**Europe**  
europe\_satcoms@stee.stengg.com

