

## BE-TV-L-U

### Genesis Aqua Series Transmitters

The GENESIS AQUA-line is the result of years-long research in terms of reliability – size reduction – structural simplicity – modularity and scalability – competitive price (*one of the best-priced transmitters in its category*).

The BE liquid-cooled transmitters, perfectly meet the needs of customers that require Medium / High Power solutions.

BE offers two lines of transmitter depending on the power level; an Internal (I) cooling system transmitter, includes two (2) to six (6) amplifiers and delivers between 2400W to 7200W OFDM or 3200W and 9,600W for ATSC or an external cooling system (shown on the right here), which includes eight (8) to thirty-two (32) amplifiers and delivers 9.6W to 38.4kW in OFDM or 12.8W to 51.2kW of RF power, all measured prior to the bandpass filter.

Its qualities of compactness, modularity, and redundancy have been applied to the transmitter design as well as to the cooling system. The Internal cooling system includes dual pumps, an expansion tank, a dual fan heat exchanger, and extensive cooling system control and monitoring. The cabinet requires minimal floor space, but still offers ease of access for monitoring and maintenance.

The new line maintains the traditional safety features of BE transmitters and improves the ease of intervention by the operators, thanks to the extremely simple design.

The wealth of technical support and design from BE allows the optimization of manufacturing processes and allows us to offer a low capital investment with reduced operating costs and a transmitter that is easy to maintain and simple spare parts management.

All transmitters are equipped with a second exciter as standard and the associated automatic switchover unit, the two units being integrated into the transmitter rack.



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### Key Features & Benefits



- Assembled in the USA
- *PTV Inside*
- Dual exciter/modulator standard
- All digital and analog modulation standards including ATSC/ATSC3.0, DVB-T/T2, ISDB-t, PAL and NTSC
- Unique “drag and drop” remote control system
- Fully broadband across UHF band
- Hot-pluggable amplifier modules
- Latest LDMOS technology for RF stages
- SFN and MFN network modes
- High stability local oscillator (*hardware option*)
- Advanced modulator with automatic/adaptive pre-correction (*linear and nonlinear*)
- Any standard change; analog to digital or digital to digital operation without hardware change
- Holds two standards (analog or digital) at the same time to allow remote change of technology
- Satellite receiver with or without CAM (*hardware option*)
- Color LCD display for easy navigation and full remote operation
- Liquid cooling with redundant pumps and redundant heat exchanger
- All critical heat sensitive parts liquid cooled including amplifiers, combiners and ballast loads
- Breakers for each individual module including all amplifiers, exciters and control system
- Display & keyboard, web browser and SNMP for remote operation
- Seamless switching between ASI/SMPTE and/or IP (*with priority*) when in SFN network mode
- Remote software/firmware upgrade



### GENERAL

Frequency Range	UHF band IV/V: 470 to 862 MHz; 1Hz steps
Analog Modulation Standards	B/G/D/K/K1/M/N, color system PAL, NTSC, SECAM
Digital Modulation Standards	ATSC 1.0; ATSC 3.0; DVB-T/T2; ISDB-Tb; DAB, DAB+
Channel Bandwidth	TV: 6, 7, or 8 MHz; DAB/DAB+: 1.5MHz
VSWR	Protection against open or short circuits, at all phase angles.
Local oscillator accuracy	$\pm 1 \times 10^{-8}$ (0 to 70°C), $\pm 5 \times 10^{-10}$ /day (after 30 days), $\pm 1 \times 10^{-7}$ /year
Network mode	SFN and MFN; multiple PLP

### RF INPUTS

GPS antenna	SMA female, 50 Ohms, (+5 V DC @ 100 mA max output for active antenna)
1 pps pulse	BNC female, 50 Ohms
10 MHz reference frequency	BNC female, 50 Ohms
F female, 75 Ohms	F female, 75 Ohms
Satellite receiver (with CAM)	F female, 75 Ohms

### RF OUTPUT

RF Output connector	2, 3, and 4 PA systems: 1 5/8" EIA. 5, 6, and 8 PA systems: 3 1/8" EIA.
RF power setting	-7 to +0dB with reference to nominal power
RF Output power stability	< +/- 0.25dB
Amplitude flatness	< +/- 0.25dB
Harmonic Emission	< -60dBc
Spurious Emission	< -60dBc
10 MHz reference frequency	SMA female, 50 Ohms, 1Vpp +/- 0.2Vpp, rise-time 3-10ns

### DIGITAL MODULATION INPUTS

TS over IP/EDI	2 x RJ45 10/100/1000BaseT
ASI/SMPTE-310/T2MI/ETI	2 x BNC female, 75 Ohms (DVB-H: 1 main/1 hierarchical), continuous and burst mode
Maximum bit rate	50 Mbps

### ANALOG MODULATION INPUTS

Video	2 x BNC fem., 75 Ohms, 1Vpp +/- 6dB, AGC on ITS line, DC rest., sync rest., white limiter
Sound	2 x XLR31 mini, 600 Ohms or 5 kOhms, balanced or unbalanced, 0dBm -6/+21dB
Aux audio input	MPX (bw 120kHz): 1 x BNC female 50 Ohms or 5 kOhms; SCA: 1 x BNC female 50 Ohms
NICAM audio interface	2 x XLR 31 mini, 600 Ohms or 5 kOhms, balanced or unbalanced, 0dBm +/- 10dB
NICAM data interface	1 x BNC female, TTL 728kb/s external data, 1 x BNC female, TTL 728kb/s external clock

### USER INTERFACE/ REMOTE CONTROL

Control/Monitoring	Color LCD touchscreen, Web GUI, SNMP
Ethernet	2x GbE

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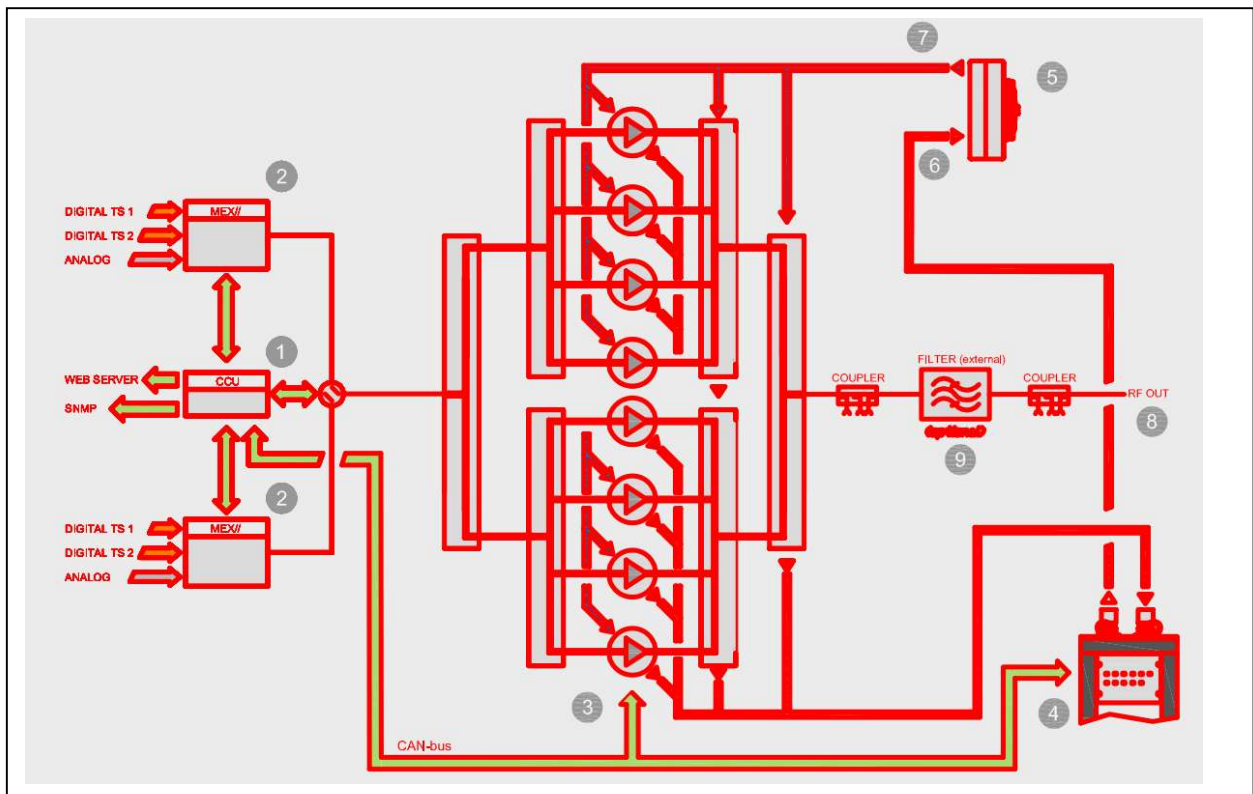
## Genesis Aqua Series Transmitters



AC POWER	
AC Input	380Vac three-phases four wires
Power Factor	> 0.95
Frequency	50 or 60 Hz

ENVIRONMENTAL	
Operational Temperature Range	0° to 45°C (32° to 113°F)
Storage Temperature Range	-40 to +70°C
Relative Humidity	0% to 90%, non-condensing @ 45°C
Altitude	Up to 2,500 m (8,202 ft) above sea level
Cooling	Liquid cooling, redundant pumps, redundant heat exchanger
Acoustic Noise	≤45 dBA (front 1 m)
Dimensions (H x W x D)	42RU x 19"rack (dimensions: 2000 H x 600 W x 1100 D [mm])



- [ 1 ] CCU TX CONTROL UNIT
- [ 2 ] MULTISTANDARD MODULATOR
- [ 3 ] HIGH POWER AMPLIFIERS
- [ 4 ] PUMP AND TANK SYSTEM
- [ 5 ] DUAL FAN HEAT EXCHANGER (H/E)
- [ 6 ] H/E INPUT
- [ 7 ] H/E OUTPUT
- [ 8 ] RF OUT TO ANTENNA / COMBINER
- [ 9 ] BAND PASS FILTER / DIRECTIONAL COUPLERS

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## Genesis Aqua Series Transmitters Power Levels



### Internal Cooling VHF Band III and UHF

<b>UHF Band IV-V RF Output Power (Before filter)</b>	<b>Number of Amplifiers</b>	<b>OFDM Modulation (DVB-T/T2, ATSC 3.0 &amp; ISDBT) MER @ 42dB</b>	<b>8VSB Modulation (ATSC 1.0)</b>	<b>VSB Modulation ATV @ IMD Typ. - 62dB</b>
BE-TV-2K4-LIU	2	2400W	3200W	6000W
BE-TV-3K6-LIU	3	3600W	4800W	9000W
BE-TV-4K8-LIU	4	4800W	6400W	12000W
BE-TV-6K0-LIU	5	6000W	8000W	16000W
BE-TV-7K2-LIU	6	7200W	9600W	19000W

### External Cooling Assembly

<b>UHF Band IV-V RF Output Power (Before filter)</b>	<b>Number of Amplifiers</b>	<b>OFDM Modulation (DVB-T/T2, ATSC 3.0 &amp; ISDBT) MER @ 42dB</b>	<b>8VSB Modulation (ATSC 1.0)</b>	<b>VSB Modulation ATV @ IMD Typ. - 62dB</b>
BE-TV-9K6-LEU	8	9600W	12800W	24000W
BE-TV-12K0-LEU	10	12000W	16000W	32000W
BE-TV-14K4-LEU	12	14400W	19200W	38000W
BE-TV-19K2-LEU	16	19200W	25600W	50000W
BE-TV-28K8-LEU	24	28800W	38400W	76000W



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## Genesis Aqua Series Transmitters

Taking the next step is easy with Broadcast Electronics. Contact your sales representative today to discuss solutions that will work for you and your station(s).

To contact your BE sales representative, simply visit our website at [bdcast.com](http://bdcast.com) or call 217.224.9600 and learn more about what BE has to offer.

BE manufactures complete RF systems for radio and TV. Our products encompass program generation, audio and data management, interfacility transport, and analog and digital (*HD Radio and DRM transmission*).

They are used daily in more than 40,000 installations in nearly 100 countries. For over sixty years, BE pioneering developments have set industry standards for innovation and reliability while providing broadcasters with new options for operational productivity and income generation. BE is headquartered in Quincy, Illinois, USA, and is represented worldwide by a network of local representatives.

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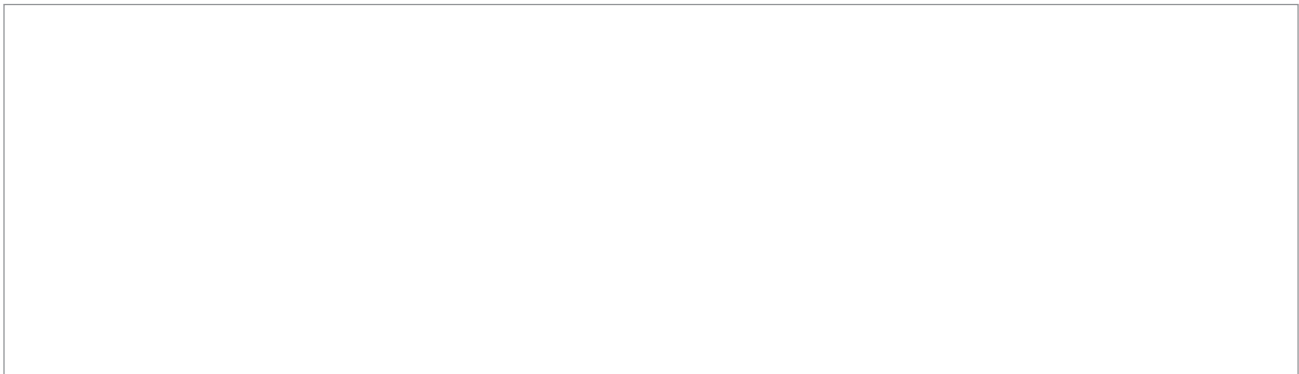
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Tomorrow's TV Today



BE Aqua Liquid Cooled UHF TV Transmitter Brochure V1.4