

# Sigma<sup>®</sup> CD

## High-Power UHF ATSC Tube Transmitter



The Sigma<sup>®</sup> CD series of high-power UHF DTV transmitters utilizes inductive output tube (IOT) technology to deliver high efficiency and superior cost performance for ATSC broadcasters. Each Sigma CD system includes a control cabinet and one to four power amplifier (PA) cabinets. The control cabinet houses the system controller, exciter, monitoring and control panel/graphical user interface (GUI) and an optional second exciter.

An upgrade is now available for the Sigma CD transmitters that will allow them to provide IP-based control and monitoring by using the Harris<sup>®</sup> eCDi<sup>®</sup> performance monitoring system, either tied to the station LAN or directly to the Internet.

### SPECIFICATIONS

Specifications are subject to change without notice.

#### General

RF Load Impedance . . . . . 50 ohms, 1.1:1 VSWR over specified TV channel  
 RF Output Connector . . . . . 4-1/16 in. flanged (at PA cabinet outputs)  
 Frequency Range . . . . . Any specified UHF TV channel, 470 to 806 MHz  
 Data Input . . . . . SMPTE 310M, 19.39 Mb/s  
 Data Input Connector . . . . . BNC, 75 ohms  
 PFC Input . . . . . 10 MHz sinusoid, 0 to +10 dBm, BNC, 50 ohms

### PERFORMANCE

#### DTV Power Output<sup>1</sup>

Model	Output Power	Model	Output Power
CD3070P1	70 kW peak, 15 kW average	CD3200P2	200 kW peak, 42 kW average
CD3100P1	100 kW peak, 21 kW average	CD3300P3	300 kW peak, 63 kW average
CD3140P2	140 kW peak, 30 kW average	CD3400P4	400 kW peak, 84 kW average

Stability of Output Power . . . . . ±2% or better  
 Frequency Stability (Pilot):<sup>2</sup> . . . . . ±200 Hz/month, ±3 Hz or better with external precision frequency control option  
 Frequency Offsets . . . . . Per FCC requirements  
 SNR (MER):<sup>3</sup> . . . . . ≥27 dB (>30 dB typical)  
 Harmonic and Spurious Radiation . . . . . Compliant with FCC requirements  
 Sideband Performance . . . . . Compliant with FCC mask, with optional Harris specified output filter

### FEATURES

- Apex M2X<sup>™</sup> multimedia exciter, allowing easy migration between standards
- Real-Time Adaptive Correction (RTAC<sup>™</sup>) technology for continuous automatic correction, ensuring optimum performance at all times
- Ultra-redundant design for unmatched reliability in a high-efficiency tube transmitter.
- “Diamond Drive” LDMOS IPAs, offering the ultimate in intermediate stage efficiency and linearity, and ensuring the best system performance. This amplifier, straight out of the Diamond CD<sup>®</sup> transmitter, is easily swapped and extremely reliable
- Independent, redundant design of power amplifier cabinets, allowing on-air maintenance in multiple-tube systems
- Automatic gain control (AGC) circuitry and high-speed Thyatron crowbar circuitry, providing superior protection for extended power amplifier life
- Reliable, distributed control architecture for outstanding reliability and simple serviceability
- Intuitive graphical user interface (GUI) for simple and easy control of the SigmaCD both locally and remotely
- Straightforward logic control, front-panel LED status indicators, and accessible design for simplified operation and maintenance
- Backed by broadcasting’s most extensive factory support, including 24-hour technical assistance, around-the-clock parts and comprehensive training

#### Service Conditions

Ambient Temperature Range:<sup>4</sup> . . . . . 32 to 113° F (0 to 45° C)  
 Ambient Humidity Range . . . . . 0 to 90% relative humidity, non-condensing  
 Altitude:<sup>5</sup> . . . . . 0 to 7,500 ft (2,286 m) AMSL

# Sigma<sup>®</sup> CD

## High-Power UHF ATSC Tube Transmitter

TELEVISION TRANSMISSION // UHF TRANSMITTERS

### Physical Dimensions

Model	Transmitter (W x D x H)	Beam Power Supply (W x D x H)	Fan Unit (W x D x H)	Pump Module (W x D x H)	AC Line Control (W x D x H)
CD3070P1 CD3100P1	1 unit, each: 82 x 55 x 72 in. (2.1 x 1.4 x 1.8 m) 2,425 lbs (1,110 kg)	1 unit, each: 46 x 56 x 62 in. (1.2 x 1.4 x 1.6 m) 3,700 lbs (1,678 kg)	1 unit, each: 44 x 92 x 43 in. (1.1 x 2.3 x 1.1 m) 685 lbs (310 kg)	1 unit, each: 36 x 62 x 66 in. (0.9 x 1.6 x 1.7 m) 800 lbs (363 kg)	1 unit, each: 36 x 12 x 60 in. (0.9 x 0.3 x 1.5 m) 365 lbs (165 kg)
CD3140P2 CD3200P2	1 unit, each: 141 x 55 x 72 in. (3.6 x 1.4 x 1.8 m) 4,525 lbs (2,052 kg)	2 units, each: 46 x 56 x 62 in. (1.2 x 1.4 x 1.6 m) 3,700 lbs (1,678 kg)	1 unit, each: 44 x 132 x 43 in. (1.1 x 3.3 x 1.1 m) 946 lbs (429 kg)	1 unit, each: 36 x 62 x 66 in. (0.9 x 1.6 x 1.7 m) 800 lbs (363 kg)	2 units, each: 36 x 12 x 60 in. (0.9 x 0.3 x 1.5 m) 365 lbs (165 kg)
CD3300P3	1 unit, each: 199 x 55 x 72 in. (5 x 1.4 x 1.8 m) 6,625 lbs (3,005 kg)	3 units, each: 46 x 56 x 62 in. (1.2 x 1.4 x 1.6 m) 3,700 lbs (1,678 kg)	1 unit, each: 44 x 172 x 43 in. (1.1 x 4.4 x 1.1 m) 1,340 lbs (608 kg)	1 unit, each: 36 x 62 x 66 in. (0.9 x 1.6 x 1.7 m) 800 lbs (363 kg)	3 units, each: 36 x 12 x 60 in. (0.9 x 0.3 x 1.5 m) 365 lbs (165 kg)
CD3400P4	1 unit, each: 258 x 55 x 72 in. (6.5 x 1.4 x 1.8 m) 8,725 lbs (3,958 kg)	4 units, each: 46 x 56 x 62 in. (1.2 x 1.4 x 1.6 m) 3,700 lbs (1,678 kg)	2 units, each: 44 x 132 x 43 in. (1.1 x 3.3 x 1.1 m) 946 lbs (429 kg)	2 units, each: 36 x 62 x 66 in. (0.9 x 1.6 x 1.7 m) 800 lbs (363 kg)	4 units, each: 36 x 12 x 60 in. (0.9 x 0.3 x 1.5 m) 365 lbs (165 kg)

Electrical Requirements:<sup>6</sup> . . . . . 480 volts, ±2%, 3-phase, 3 or 4 wire, 60 Hz

Power Factor . . . . . 0.9, or better

Power Consumption (typical, including cooling)			
CD3070P1	66 kW	CD3200P2	184 kW
CD3100P1	93 kW	CD3300P3	275 kW
CD3140P2	130 kW	CD3400P4	366 kW

### Notes

- <sup>1</sup> Average power outputs are after FCC mask filter and typical RF combining systems, if present.
- <sup>2</sup> After initial aging of 60 days.
- <sup>3</sup> Signal-to-noise ratio (modulation error ratio) measured with HP89440A/HP89441A vector signal analyzer.
- <sup>4</sup> Derate maximum temperature linearly, from 45° C at sea level by 2° C per 1,000 ft. up to 7,500 ft. For operation outside these limits, consult Harris.
- <sup>5</sup> For higher altitude operation, consult Harris.
- <sup>6</sup> Other AC voltages available, consult Harris.