

ZHC518D-5000W Digital TV Transmitter



1. Overview

ZHC518D-5000W (5000W, air-cooled, indoor type) UHF terrestrial digital TV broadcast transmitter consists of main (backup) exciter, switcher (optional), push, power distribution, power amplification (including power distribution, amplification, synthesis) , Power synthesis, detection, control display, power amplifier switching power supply, cooling and other functional units. It puts various functional units in different chassis to form a 19-inch standard cabinet, which has the advantages of simple structure and strong integrity.

The outer surface of the cabinet adopts electro-galvanized post-spray anti-corrosion technology, high-strength cold-rolled steel plate is processed by high-precision numerical control, and the overall structural performance is excellent.

2. Features

- The exciter uses digital technology to process signals, with high indicators, complete interfaces, and online software upgrades.
- The switcher (optional) dynamically detects and monitors the output of the exciter and alarm signal, which can be remotely controlled to switch, automatically switch or manually switch.
- The display control of the whole machine adopts a large 8-inch touch LCD screen as the display unit, and the display page is clear and clear. It is convenient and quick to check the system parameters and the status of the power amplifier unit. The display control of the power amplifier unit adopts LED as the status indicator, which is simple and clear. Set the working parameters and interface configuration of the transmitter through the control panel or remote monitoring interface. After power off or restart, the original setting state can be automatically restored.
- Using the coupling loop directional coupler to detect the forward and reverse power, with good directivity and high isolation.
- With automatic power control and automatic protection functions, when the transmitter has a serious failure (such as output overload, power amplifier overheating, overvoltage, overcurrent, excessive reflected power, etc.), or when the transmitter is damaged due to external reasons, the monitoring system It will automatically reduce the transmission power or cut off the transmitter's RF output or shut down.
- Provide serial and TCP/IP communication interfaces, provide real-time monitoring and alarm functions. Monitoring content includes: equipment working status and parameter configuration, etc. When an abnormal situation occurs in the equipment, an alarm indication is given, and the monitoring and alarm can be controlled and inquired remotely. It is convenient for users to realize unattended remote monitoring and control.
- The power amplifier unit is composed of twelve 450W power amplifiers. Each 450W power amplifier uses four imported high-efficiency high-power super-linear field effect tubes BLF888D, which has anti-high standing wave ratio (40:1), anti-static, and high efficiency (Doherty is greater than 40%), the advantage of good linearity. The input and output of the power amplifier tube adopts microstrip impedance transformation, imported high-frequency board material, small size, low loss, consistent performance, and easy to produce without debugging. Power distribution and synthesis use in-phase distribution and synthesis technology. The power distribution adopts microstrip technology, which has the advantages

of good consistency and small size. The power synthesis adopts the patented technology of suspended strip line synthesis, four-channel input two-stage synthesis, which has the advantages of large power capacity, high isolation, and insertion loss less than 0.3dB.

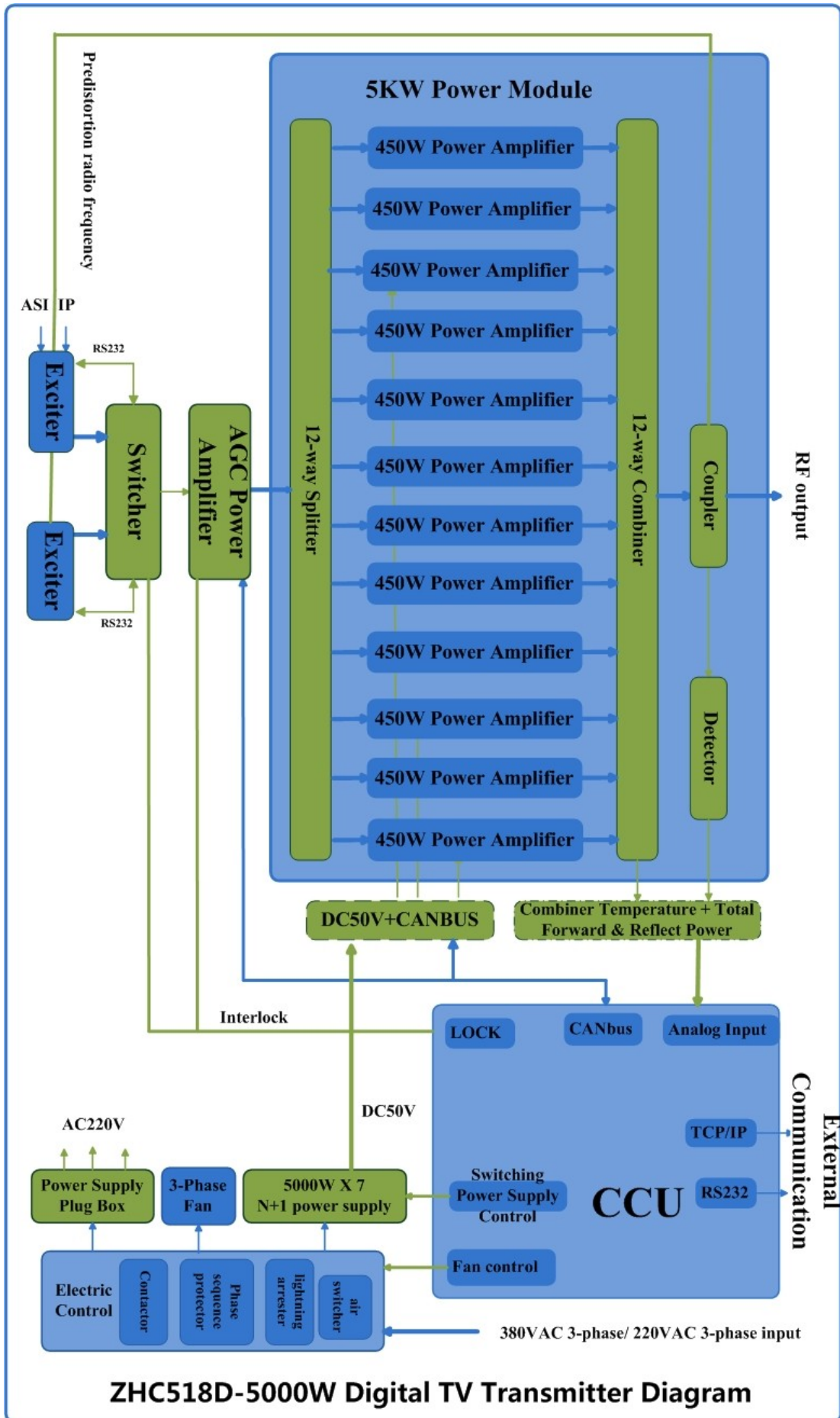
- The power distribution and synthesis unit of the whole machine adopts in-phase distribution and synthesis technology. The power distribution adopts microstrip technology, which has the advantages of good consistency and small size. The power synthesis adopts the patented technology of high-power distributed parameter synthesis, twelve-channel input one-stage synthesis, which has the advantages of large power capacity, high isolation, and insertion loss less than 0.1dB. The high-power absorbing load and the large-volume fan can ensure that the transmitting system does not stop working in the case of a power amplifier module failure, which greatly reduces the risk of stopping the broadcast.

- The AC power input of the whole machine is equipped with a B1 arrester protection system imported from Phoenix, Germany, to avoid lightning damage.

- The control power system adopts imported high-reliability and high-efficiency switching power supply with power factor correction. Wide operating voltage range and high reliability.

- The power amplifier power system can adopt parallel redundant centralized power supply, and a N+1 system is formed by multiple independent switching power modules in parallel, which are mutual backups. If one is damaged, the normal operation of the system can be guaranteed. Adopt brand high-quality high-power 5000W switching power supply, with large margin, high efficiency, low ripple, anti-interference, and good electromagnetic compatibility. Whether the output of the switching power supply is controlled by the control display unit. Each switching power supply module interface is hot-swappable, easy to replace and maintain; comes with fan cooling; has over-voltage, over-current and over-temperature protection; LED displays working status and alarm signals; the input power supply system adopts high-efficiency AC three-phase 380V power supply.

- The power amplifier unit adopts forced air cooling. The use of large air volume centrifugal fan has a life of up to 100,000 hours, large air volume, noise below 60dB, and good cooling effect, which can ensure the normal operation of the transmitter.



3. Technical Details

3.1 Equipment performance meets the following standards

GB/T 28435-2012 Technical requirements and measurement methods for terrestrial digital TV broadcast transmitters

GB 20600-2006 Digital TV terrestrial broadcasting transmission system frame structure, channel coding and modulation

GB/T 28436-2012 Technical requirements and measurement methods for terrestrial digital TV broadcast excitors

GB/T 12572-2008 General requirements and measurement methods for parameters of radio transmitting equipment

GB 9159-2008 Safety requirements for radio transmitting equipment

GB/T 2829-2002 Periodic Inspection Attribute Sampling Procedure and Table

GB/T 14433-1993 Technical Regulations for Color Television Broadcasting Coverage Network

SJ/T 11574-2016 General Specification for Digital TV Terrestrial Broadcast Transmitter

SJ/T 10351-1993 General technical requirements for television transmitters

3.2 Technical Specifications

1. RF frequency range 470~860MHz
2. Output power 0~rated power continuously adjustable
3. Allowable deviation of output power $< \pm 0.5\text{dB}$
4. Output power stability $< \pm 3\%$
5. Output impedance 50Ω
6. Residual wave in adjacent channel $< -45\text{dB}$ (optional bandpass filter)
7. The residual wave outside the adjacent channel $< -67\text{dB}$ (optional bandpass filter)
8. Switching mode of main and standby excitors:
automatic/manual (when the main exciter equipment is damaged or there is no output)
9. RF input connector N-50K
10. RF output connector 1-5/8" or 3-1/8" Flange (optional)
11. Exciter input interface:
 - a) ASI input interface BNC (female) 50Ω
 - b) IP input interface RJ-45
12. Radio frequency monitoring interface BNC (female) 50Ω
13. Remote monitoring interface RS232/RS485 DB9 (male) or RJ45 Ethernet interface
14. Lightning protection The cabinet has a built-in lightning arrester.
15. Power supply voltage 3-phase AC380V/3-phase AC220V 50Hz/60Hz (optional)
16. Cooling method forced convection
17. Overall efficiency $\geq 20\%$
18. Channel bandwidth 6/8MHz (optional)
19. Power input level 0dBm
20. In-band fluctuation $\pm 0.5\text{Db}$
21. Shoulder better than 36dB

22. MER better than 32dB
23. (Optional) Digital TV standard:
1. National Terrestrial Digital Television Standard (DTMB): GB20600-2006
 2. China Mobile Multimedia Broadcasting and Television (CMMB): GY/T220.1-2006
 3. European standard for terrestrial digital TV standard: (DVB-TC (H)): ETS1300744

3.3 Physical Specifications

1. Chassis standard 19 inches 43U
2. Chassis size 850mm (width) × 2000 (height) mm × 1200 (depth) mm
3. The weight of the whole machine 450kg
4. Operating environment temperature $-10^{\circ}\text{C} \sim +50^{\circ}\text{C}$
5. Relative humidity $\leq 95\%$
6. Altitude $\leq 5000\text{m}$
7. Atmospheric pressure 86kPa~106kPa