

DTU-70 Series Liquid-Cooled Digital UHF TV Transmitter

More than great performance
for your smarter operation



With optional LCD

Select DTU-70 as your principal digital transmitter; it must be a good choice for your ideal DTV operation.

DTU-70 series is the newest model of digital TV transmitter produced by NEC, which has been developed on abundant experience accumulated over many years history.

As well as its compact body, DTU-70 series has achieved improvement of its power efficiency up to 25% compared with the former model. The new feature realizes reduction of Total Cost of Ownership. Also, the DTU-70 supports DVB-T/ DVB-T2, ISDB-T/Tb, ATSC digital standards.

Features

High Efficiency

● Better than 25%

By NEC innovated technology, the DTU-70 Series realize efficiency values of more than 25%.

<Innovative technology >

- VDD optimization of PA for stable voltage.
- Crest factor reduction with new exciter, and new non-linear correction for keeping optimum performance.



Smaller Footprint

● 14.3 kW per Rack

Up to 14.3kW output power (average), using 12 sets of PA units, can be provided in a single rack. The occupied footprint has been reduced up to 63 % compared with the former model. 615 (W) x 2,000 (H) x 1,200 (D) mm can be considered as one of the smallest digital TV transmitter.

- Built-in pump unit and band-pass filter for same one rack with transmitter up to five amplifiers

Flexible System Configuration

Various system types can be proposed depending on flexible customers' requirement, such as:

- * Single transmitter
- * Single transmitter with dual exciter
- * 1+1 System (Main Stand-by)
- * Active Stand-by (Parallel Operation)
- * N+1 System

The latest technology in digital broadcasting

Power Amplifiers (PA)

The newly developed UA5000QF power amplifier utilizing the latest high power LDMOS, and each PA can produce an output power of 1350W average. With the added benefit of self-protection circuits against external factors such as high temperature, reflected power, low AC voltage and internal factors such as overvoltage and over current.

Additionally, the PA is equipped with RF over input protection, which has a function of protecting the PA against excessive output power produced from the exciter due to human mis-operation and from the excessive input power in case there is malfunction in the divider. In terms of safety features, the PA is incorporated with a RS-485 interface, enabling comprehensive monitoring and remote control functionality.



UA5000QF

Exciter

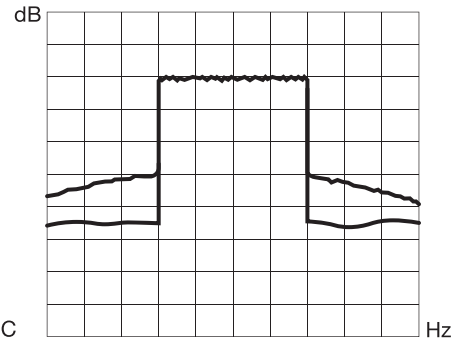
The compact Exciter is packed with NEC's state-of-the-art technology. A synthesizer can be tuned to all UHF-band signals enables all-band direct conversion to a RF output. Higher or lower bit rates are modified to usable bit rates for flexible bit-rate adaptability for MFN for DVB-T. A truly impressive characteristic of the NEC's Digital Exciter is its ability to work in conjunction with other NEC transmitters as a signal processor.



DM Series

Adaptive Digital Corrector (ADC)

The ADC automatically generates correction factors of non-linearity distortion and updates the correction table without interrupting program service. Optimum signal quality and service coverage are maintained, protected from the effects of ambient temperature, aging and other factors. The ADC comes integrated in the NEC's Digital Exciters and can be used to generate the correction factor for preset correction. Furthermore, the ADC is capable of analyzing feedback signals from the TX output, including inter-modulation level and MER or SNR value. Automatic adjustment of the IMP/MER/SNR values greatly reduces the time required for maintenance.



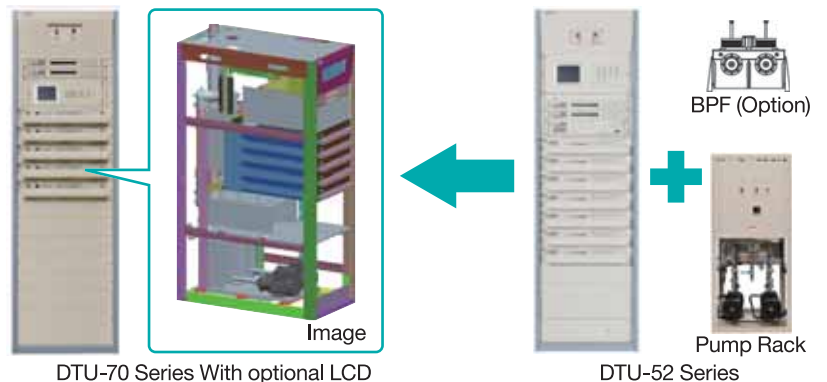
Sample of improvement by ADC

Functionality Benefits

Smaller Footprint

* Maximum power of one rack is 14.3 kW that gives 63% footprint against previous series.

* Pump and BPF can be built in one rack transmitter for up to 5 PAs that gives great saving of footprint and installation cost.



DTU-70 Series With optional LCD

DTU-52 Series

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N+1 System

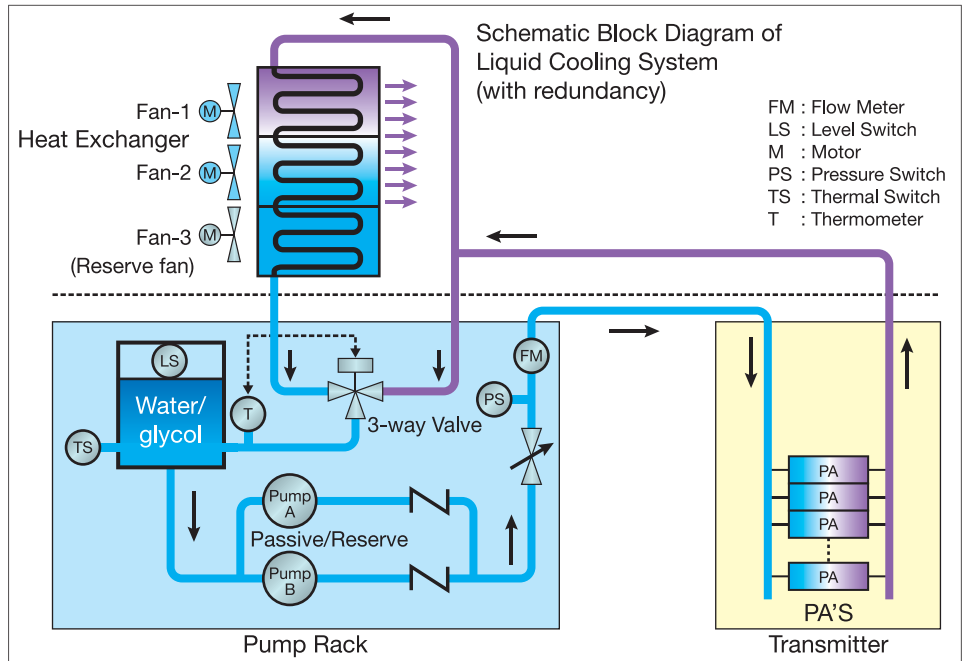
The DTU-70 Series frequency-agile design, allows for the construction of an N+1 system, offering redundancy for maximized reliability and transmission time. By using the latest N+1 controller, up to 8+1 system are available. At any given time, there is a transmitter ready to be activated should one of the active transmitters malfunction. When activated, the reserve transmitter is immediately selected with the required frequency and parameter.

Liquid Cooling

The liquid cooling system incorporates an automatic air-purge function and no external pump is requested to feed coolant. These features work together to cut noise and installation costs, making the maintenance easier and boosting reliability. Coolant feeding and dust removal have been greatly simplified by a hybrid closed circuit, ensuring the coolant remains clean. There are two types of cooling systems that can be selected from the transmitter models.

“S type” comes with single drive and single pump and heat exchanger.

“P type” comes with dual drive exciter, redundant pumps and fan of the heat exchanger.

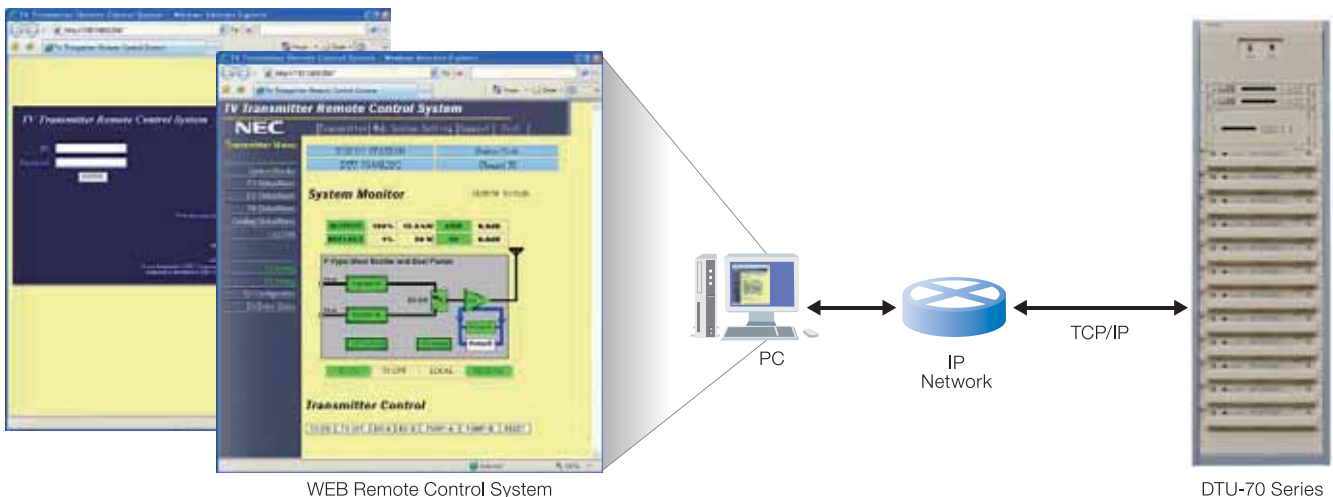


Optional Color LCD

A Color LCD screen is available as option, which features an intuitive GUI (Graphical User Interface), making transmitter control, monitoring and maintenance extremely easy to perform. The log data not only displays changes in operational status, including faults, but also enables verification of related data in case of system failure, thereby streamlining analysis of abnormal status. Frequency setting can be conducted at the touch of a button on the Color LCD screen.

Remote Control / Monitoring

The DTU-70 Series incorporates a web server and SNMP agent, enables the transmitter to be conducted to a local area network for monitoring and control of transmitter operations via a remote PC with a web browser. Whilst also allowing a SNMP manager to monitor and control from a different location at the same time. Thus, provide a cost-efficient maintenance, whilst the transmitter is in operation and without the requirement of expensive measurement equipment.



Configuration of DTU-70 Series

Transmitter Configuration Table

DTU-70 / **1** **2** **3** **4**

1 : Output Power

Type	Output Power
2R5	2.5KW
3R7	3.7kW
4R9	4.9KW
6R1	6.1kW
7R3	7.3kW
8R5	8.5kW
9R7	9.7kW

Etc..

Please see the details below

2 : System Type

S : Single Transmitter with Single Drive

P : Single Transmitter with Dual Drive, Multiple PAs

3 : Cooling Type

Q : liquid cooling system

QF : Built-in liquid cooling system

4 : Option

nil : Standard transmitter

B : Built-in band-pass filter

Built-in pump unit and band-pass filter for same one rack with transmitter up to 6.1kW output power.

Transmitter Configuration Table

Output Power	Model Name* (Dual Type)	Equipment Composition [Sets]						Transmitter	
		Exciter	Exciter switch	PA	TX Control	TX Rack	Cooling Rack	Size [mm]	Weight (Kg)
2.5KW	DTU-70/2R5PQ	2	1	2	1	1	Built-in TX Rack	615(W) × 2,000(H) × 1,200(D)	470
3.7KW	DTU-70/3R7PQ			3					510
4.9KW	DTU-70/4R9PQ			4					550
6.1KW	DTU-70/6R1PQ			5					590
7.3KW	DTU-70/7R3PQ			6					500
8.5KW	DTU-70/8R5PQ			7					540
9.7KW	DTU-70/9R7PQ			8					580
10.9kW	DTU-70/10R9PQ			9					620
12.0kW	DTU-70/12R0PQ			10					660
14.3kW	DTU-70/14R3PQ			12					740
16.5kW	DTU-70/16R5PQ			14		1030			
19.0kW	DTU-70/19R0PQ			16		1110			
21.0kW	DTU-70/21R0PQ			18		1190			
23.5kW	DTU-70/23R5PQ			20		1270			

* Single Type is one Exciter configuration. It correspond to each output power above .

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DTU-70 Series Specifications

Specification	DVB-T	DVB-T2	ATSC	ISDB-T/Tb
Output Power	2.5kW to 23.5kW (*1) 1.8kW to 17.5kW(*1) at IM < -43 dB applicable in case of ISDB-T/Tb			
Output Frequency	470 – 862 (Band IV/V)			
Output Impedance	50Ω			
Input	4 x ASI, BNC 75 Ω (in pairs, prepared for hierarchical)	2 x ASI(T2-MI), BNC 75 Ω 1 x IP (Option) for DM-4100A	2 x SMPTE310, BNC 75 Ω	1 x ASI, BNC 75 Ω
Power Supply Voltage	380/400/415 V 3-Phase, 4-wire			
Voltage Fluctuation	-15%, +10%			
Power Supply frequency	50/60 Hz ±2%			
Ambient Temperature Range	Indoors: 0°C to +45°C Outdoors: 0°C to +45°C or -30°C to +40°C (using antifreeze and 3-Way valve system)			
Relative Humidity	≤ 90% (no condensation)			

*1: measured before mask filter output

Standard Performance	DVB-T	DVB-T2	ATSC	ISDB-T/Tb
Frequency Stability	≤ ±1 x 10 ⁻⁷ /year (internal reference use) (It is also possible to lock an external 10MHz reference)			
Amplitude-frequency Response	≤ ±0.5 dB (excluding BPF)			
Bandwidth	6, 7, 8MHz	5, 6, 7, 8MHz	6MHz	6, 8MHz
Intermodulation Products	< -36 dB	< -36 dB	-	< -36 dB
MER (Modulation Error Ratio)	> 32 dB	-	-	> 32 dB
SNR (Signal to Noise Ratio)	-	≥ 33dB	≥ 27dB	-
Spurious Emission	≤ -60dBc	≤ -60dBc	FCC Emission Mask with Output Filter	≤ -60dBc

ISO 9000 Series



ISO 9001 JMI-0119
NEC Broadcast and Video

ISO 14001



JQA-E-90066
NEC



Safety precautions

To install, make connections and operate this product, please carefully read and observe instructions, precautions and recommendations in our instruction manuals.

● The colours in this brochure may differ from those of the actual unit. Designs and specifications of this product is subject to change without prior notice.

For additional information:

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