

# For an efficient future: new liquid-cooled, VHF high-power transmitters

The liquid-cooled VHF high-power transmitters of the new R&S®Nx8500 family are energy-efficient and compact. This family of transmitters serves as a worldwide multistandard platform for analog, digital and mobile television as well as digital audio broadcasting. It provides safety of investment due to its ease of upgradeability to future standards such as DVB-T2.

## A future-safe investment

The new R&S®Nx8500 family of liquid-cooled VHF transmitters (FIG 1) is versatile and can be used worldwide: In addition to analog TV, it supports the DVB-T, ATSC, ISDB-T/ISDB-T<sub>B</sub> and DTMB digital TV standards. The transmitters also cover mobile TV standards, i.e. DVB-H, T-DMB, MediaFLO™ and ATSC Mobile DTV, as well as DAB/DAB+ digital audio broadcasting. Their compact system design and high energy efficiency help to reduce infrastructure and life cycle costs.

As the market leader, Rohde&Schwarz offers its customers maximum safety of investment for their products. For example, the software-based signal processing used in the transmitters allows network operators to respond flexibly to extensions to existing standards and quickly integrate them into installed networks. The transmitter family is already prepared to handle the DVB-T successor standard DVB-T2 (see also page 25 in this issue) and simplifies the transition.

The R&S®NA8500 transmitter family is also impressive in the area of digital audio broadcasting: For DAB/T-DMB, the transmitters together with the R&S®Sx801 exciter provide an outstanding signal-to-noise ratio of typically 36 dB which, when measured using the R&S®ETL TV analyzer, corresponds to an MER value of typically 33 dB.

Users of the R&S®Nx8500 transmitter family also benefit from the cross-platform module concept of the R&S®Nx8000 generation of transmitters. Important components such as exciter, transmitter control unit and liquid cooling system are used in a consistent manner in the different transmitter families for TV and digital audio broadcasting in the VHF and UHF bands. Network operators who deploy different transmitters from a single family or from the transmitter generation require less spare parts and can lower the training costs for their operating personnel.

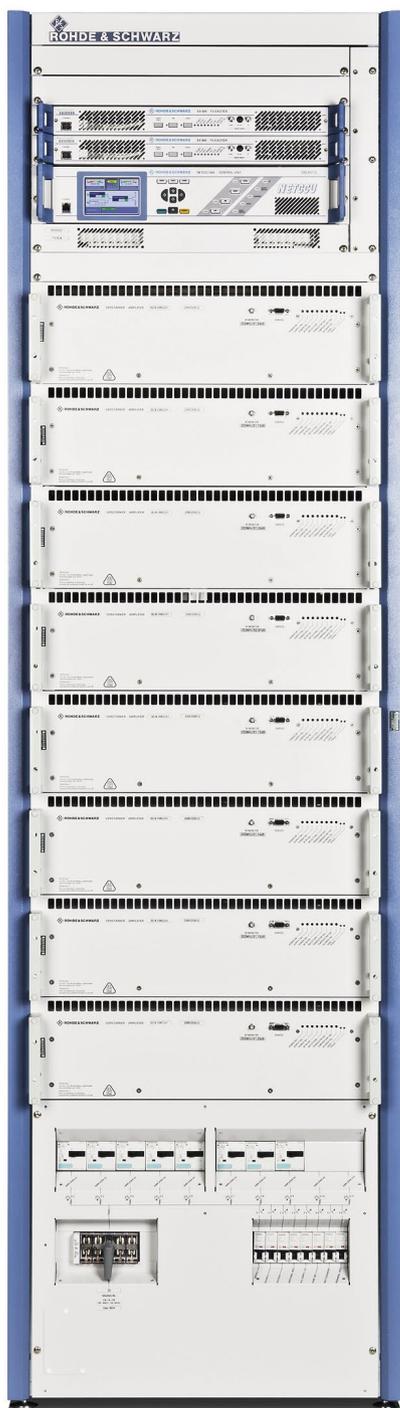


FIG 1 The R&S®Nx8500 transmitter family delivers top reliability through consistent use of tried-and-tested components.



FIG 2 The new R&S®ZK820S2 pump unit supplies up to two fully equipped transmitter racks and requires only a minimum of space for installation.

## Compact, efficient cooling

In the case of terrestrial broadcast networks, operating costs quite often exceed the cost of the investment, making the efficiency of the overall system a critical factor. Accordingly, the focus was on energy savings when designing the R&S®Nx8500 transmitter family. The liquid-cooling system makes a substantial contribution in this area. In the pump unit, two powerful pumps with low energy consumption operate in active standby. Additional energy savings are achieved by having the control unit regulate the speed of the fans on the heat exchanger as a function of the ambient temperature. The electronically commutated fans in the heat exchangers reduce energy costs by up to 30 % compared to conventional fans.

The closed cooling circuit helps to minimize external influences. Precisely setting the flow rate for the coolant to match the individual system configuration increases the efficiency, while the intelligent automatic monitoring of the cooling system ensures stable, continuous operation of the transmitter.

Rohde&Schwarz has developed the additional R&S®ZK820S2 pump unit which, despite its small footprint and low energy consumption, can supply two fully equipped transmitter racks with the necessary coolant (FIG 2). The integrated liquid distributor reduces installation effort as well as material costs. This is the most compact cooling system on the market.

Axel Menke

## Reduced infrastructure costs

The carefully planned concept underlying this family of transmitters significantly reduces the infrastructure costs over the product life cycle. Per rack, for example, the R&S®Nx8500 transmitters generate output power levels of up to 10 kW for analog TV, up to 4.0 kW for COFDM TV standards, up to 5.8 kW for ATSC and 4.1 kW for DAB(+)/T-DMB. Due to their 19" width and rack depth of 1200 mm, they take up only a minimum of space at the transmitter site.

The new pump unit can be installed on the floor, the wall or on a second pump unit. Heat exchangers are available for vertical and horizontal installation. The sophisticated installation concept provides perfect harmonization of the design of all components and ensures that the system can be flexibly adapted to the individual conditions at any transmitter site.

### Condensed data of the R&S®NM/NW/NA8500

#### General

Dimensions (W × H × D)	600 mm × 1200 mm × 2200 mm
Power connection	3 × 400 V ±15 %, 47 Hz to 63 Hz

#### R&S®NM8500

Standards	B/G, I, M, N, K
Color transmission	PAL, NTSC, SECAM
Sound modulation	IRT dual sound, mono, stereo, NICAM
Output power	4.0 kW to 20 kW

#### R&S®NW8500

Standards	DVB-T/-H, DVB-T2 (prepared), ATSC, ATSC Mobile DTV, DTMB, ISDB-T/ISDB-T <sub>B</sub>
COFDM output power	1.0 kW to 7.8 kW
ATSC output power	1.5 kW to 11.5 kW

#### R&S®NA8500

Standards	DAB, DAB+, T-DMB
Output power	1.0 kW to 8.0 kW