

Specifications

VX-820/870 SERIES		
	VHF	UHF
General Specifications		
Frequency Range	134-174 MHz	400-470 MHz 450-512 MHz
Number of Channels	512 (VX-829/824/879/874) / 16 (VX-821/871)	
Number of Groups	32 (VX-829/824/879/874) / 1 (VX-821/871)	
Channel Spacing	12.5 / 20 / 25 kHz	
PLL Steps	1.25 / 2.5 / 5 / 6.25 kHz	5 / 6.25 kHz
Operating Voltage	7.4 VDC ±20 %	
Current Consumption		
STBY (w/save)	75 (30) mA	75 (30) mA
RX	200 mA	200 mA
TX	1.7A	1.9A
Battery Life (w/Battery save) (RX 5 : TX 5 : STBY 90 Duty)	12.5 h (16 h) w/ FNB-V87LI	11.5 h (15 h) w/ FNB-V87LI
Temperature Range	-22° F to + 140° F (-30° C to +60° C)	
Frequency Stability	±2.5 ppm	
Dimensions (W x H x D)	2.3" x 3.8" x 1.5" (57.5 x 96.5 x 37.5 mm)	
Weight (approx.)	10.9 oz (310 g) w/Ant, Battery (FNB-V86LI) and Belt clip	
Receiver Specifications		
Sensitivity (12 dB SINAD) EIA	0.25 / 0.32 µV	
Adjacent Channel Selectivity (W/N)	75 / 70 dB	
Intermodulation (W/N)	75 / 70 dB	
Spurious and Image Rejection	75 dB	
Hum and Noise (W/N)	48 / 42 dB	
Audio Out put	700 mW @16 Ohms, 5 % THD	
Transmitter Specifications		
Power Output	5 / 2.5 / 1 / 0.25 W	
Modulation	16K0F3E 11K0F3E	
Spurious Emissions	70 dB	
FM Hum and Noise (W/N)	45 / 40 dB	
Audio Distortion	Less than 3 % @ 1kHz	

Measurements per EIA standards unless noted above. Specifications are subject to change without notice or obligation.

VX-820/P820 Series : Applicable International Protection Standard

IP54 Splash Proof	IP55 Water Jets	IP57 Submersible 3 feet for 30 min	IS Special Order Version Intrinsically Safe Version Available
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VX-820/870/P820/P870 Series : Applicable MIL-STD

Standard	MIL 810C Methods/Procedures	MIL 810D Methods/Procedures	MIL 810E Methods/Procedures	MIL 810F Methods/Procedures
Low Pressure	500.1/Procedure I, II	500.2/Procedure I, II	500.3/Procedure I, II	500.4/Procedure I, II
High Temperature	501.1/Procedure I, II	501.2/Procedure I, II	501.3/Procedure I, II	501.4/Procedure I, II
Low Temperature	502.1/Procedure I, II	502.2/Procedure I, II	502.3/Procedure I, II	502.4/Procedure I, II
Temperature Shock	-	-	-	503.4/Procedure I
Solar Radiation	505.1/Procedure I	505.2/Procedure II Cat. A1	505.3/Procedure II Cat. A1	505.4/Procedure I, II Cat. A1
Rain	506.1/Procedure I	506.2/Procedure I	506.3/Procedure I, II	506.4/Procedure I
Humidity	507.1/Procedure I, II	507.2/Procedure II, III	507.3/Procedure II, III	-
Salt Fog	509.1/Procedure I	509.2/Procedure I	509.3/Procedure I	509.4/Procedure I
Dust	510.1/Procedure I	510.2/Procedure I	510.3/Procedure I	510.4/Procedure I, III
Immersion*	512.1/Procedure I	512.2/Procedure I	512.3/Procedure I	512.4/Procedure I
Vibration	514.2/Procedure I Cat. 10,8	514.3/Procedure I Cat. 10	514.4/Procedure I Cat. 10	514.5/Procedure I Cat. 20,24
Shock	516.2/Procedure I	516.3/Procedure I	516.4/Procedure I	516.5/Procedure I

\*VX-870 / P870 Series

Intrinsically Safe Information

The Intrinsically Safe Version of VX-820/870/P820/P870 series, equipped with any of optional units, meets the requirements of ANSI/UL913 6th Edition for Class I, Division 1, Groups A-D; Class II, Groups E-G; and Class III for hazardous locations.

**Vertex Standard**  
*We make a difference*

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VX-P820/P870 SERIES		
	VHF	UHF
General Specifications		
Frequency range	134 - 174 MHz	380 - 450 MHz 450 - 512 MHz
Number of Channels	512 (VX-P829/P824/P879/P874) / 16 (VX-P821/P871)	
Number of Groups	32 (VX-P829/P824/P879/P874) / 1 (VX-P821/P871)	
Channel Spacing	12.5 / 20 / 25 kHz	
PLL Steps	1.25 / 2.5 / 5 / 6.25 kHz	5 / 6.25 kHz
Operating Voltage	7.4 VDC ±20 %	
Current Consumption		
STBY (Analog / Digital)	90 / 130 mA	90 / 130 mA
RX	250 mA	250 mA
TX	1.7 A	1.9 A
Battery Life (w/Battery save) (RX 5 : TX 5 : STBY 90 Duty)	10.6h (13.0 h) w/ FNB-V87LI	11.0 h (13.0 h) w/ FNB-V87LI
Temperature Range	-22° F to + 140° F (-30° C to + 60° C)	
Frequency Stability	±2.5 ppm	
Dimensions (W x H x D)	2.3" x 3.8" x 1.5" (57.5 x 96.5 x 37.5 mm)	
Weight (approx.)	10.9 oz (310 g) w/Ant, Battery (FNB-V86LI) and Belt Clip	
Receiver Specifications	Measurements made per TIA/EIA-603 (Analog), TIA-102 CAAA (Digital)	
Sensitivity (12 dB SINAD) EIA	0.25 µV	0.32 µV
Digital 5% BER	0.25 µV	0.32 µV
Digital 1% BER	0.35 µV	0.40 µV
Adjacent Channel Selectivity Analog (W/N)	75 / 70 dB	
Intermodulation Analog (W/N)	75 / 70 dB	
Spurious and Image Rejection Analog	75 dB	
Hum and Noise Analog (W/N)	48 / 42 dB	
Audio Output	700 mW @16 Ohms, 5% THD	
Transmitter Specifications	Measurements made per TIA/EIA-603 (Analog), TIA-102 CAAA (Digital)	
Power Output	5 / 2.5 / 1 / 0.25 W	
Modulation Analog (W/N)	16K0F3E / 11K0F3E	
Digital	8K10F1D / 8K10F1E	
Spurious Emissions	70 dB	
FM Hum and Noise Analog (W/N)	46 / 40 dB	
Audio Distortion	Less than 3 % @ 1kHz	

VX-870/P870 Series : Applicable International Protection Standard

IP65 Water Jets	IP67 Submersible 3 feet for 30 min	IP68 Super Submersible 6 feet for 3 hrs	IS Special Order Version Intrinsically Safe Version Available
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ISO9001:2000



YAESU MUSEN CO., LTD  
ISO9001:2000 certification

ISO14001:2004



YAESU MUSEN CO., LTD  
ISO14001:2004 certification

# VX-820/870 SERIES

## VHF • UHF Portable Radios



VX-P820 /P870 Series



**VX-829/879/P829/P879**

512 ch/32 groups with 16 Keys and LCD

IP54 Splash Proof	IP55 Water Jets	IP57 Submersible 3 feet for 30 min
VX-820 Series		

**VX-824/874/P824/P874**

512 ch/32 groups with 4 Keys and LCD

IP65 Water Jets	IP67 Submersible 3 feet for 30 min	IP68 Super Submersible 6 feet for 3 hrs
VX-870 Series / Special Order Version		

**VX-821/871/P821/P871**

16 ch/1 group without LCD

IS Special Order Version Intrinsically Safe Version Available
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**Vertex Standard**  
*We make a difference*



**Reliability, ruggedness, and interoperability like never before. The VX-P820/P870 series of Vertex Standard portables is ready to respond when you are, with a wide array of signaling capability, along with big audio, operator and system security measures, and PC programmability for quick deployment. Submersible to IP57 (VX-P820)/IP68 (VX-P870) specifications, and built to U.S. MIL-STD specifications, the VX-P820/P870 Portables are your assurance of long-term reliability under the most difficult operating circumstances.**



512 ch/32 groups with 16 Keys and LCD

512 ch/32 groups with 4 Keys and LCD

16 ch/1 group without LCD

P25 contains special provisions for Emergency Calling. When an "Emergency" signal is received, the radio's "Busy" LED can provide a very bright white blinking indication while the LCD can show the Unit ID or Alpha Tag of the unit in distress...

•CTCSS / DCS Encode and Decode •DTMF ANI/DTMF Paging  
 (optional FVP-25 required for DTMF Paging) •2-Tone Encode  
 and Multiple 2-Tone Decode •User Selectable Tone (VX-P829  
 P824/P879/P874) •Scan: Channel Scan, Priority Scan, Dual  
 Watch, Follow-me Scan, Follow-me Dual Watch, and TA Scan  
 •Compander (Wide and Narrow Band) •Lone Worker  
 •Programmable Function Keys •PC Programmable •Power  
 Output: 5 W •Battery Indicator •Wide / Narrow (12.5 / 20 / 25  
 kHz programmable per channel) •Speed Dial (16-key version  
 only) •Large LCD (Dot Matrix / 12 Characters +7 Segments / 3  
 Characters) (VX-P829/P824P879/P874) •7-Color LED for Incoming  
 Call Alert •Programmable Home Channel Function •ARTS™  
 (Auto-Range Transpond System) •BCLO / BTLO and TOT



# VX-820/870 SERIES

VHF • UHF Portable Radios



**VX-829/879**

512 ch/32 groups with 16 Keys and LCD

**VX-824/874**

512 ch/32 groups with 4 Keys and LCD

**VX-821/871**

16 ch/1 group without LCD

## VERSATILITY

**VX-829/824/879/874 with LCD:**

**Maximum 512 Channels / 32 Groups**

**VX-821/871 w/o LCD: Maximum 16 Channels / 1 Group**

The LCD-equipped version provides massive channel storage capability: up to 512 channels may be programmed into as many as 32 groups. A single radio may therefore be programmed with channel sets for a number of different jurisdictions or organizations, ensuring seamless interoperability. The VX-820/870 Series without the LCD can accommodate up to 16 channels in a single memory group.

### CTCSS / DCS Encode and Decode

High-performance Encoder/Decoder circuits for both CTCSS and Digital Code Squelch are provided, for access to tone/code controlled systems. DCS is ideal for crowded RF environments, providing superior immunity from false opening of the squelch.

### DTMF ANI / DTMF Paging

**(optional FVP-25 required for DTMF Paging)**

Fleet and network operation are enhanced by the built-in DTMF ANI circuit.

### 2-Tone Encode and Multiple 2-Tone Decode

The VX-820/870 Series can transmit a 2-Tone paging call, and can receive 2-Tone calls using different tone combinations.

### User Selectable Tone (VX-829/824/879/874)

One of the front panel's "programmable" keys may be designated so as to allow the user to select a CTCSS or DCS tone from a pre-defined Tone Table.

### Scan: Channel Scan, Priority Scan, Dual Watch, Follow-me Scan, Follow-me Dual Watch, and TA Scan

The VX-820/870 Series provides unmatched flexibility in its scanning features. Designed to optimize operation in a wide variety of system environments, these scanning capabilities ensure that you never miss an important call!

### Compander (Wide and Narrow Band)

For operation in systems requiring Companding, the VX-820/870 Series portables include both Wide- and Narrow-band Companding circuitry, programmable channel by channel.

### Lone Worker

The Lone Worker feature is designed to emit an alarm for 30 seconds when the Lone Worker Timer (programmed by the dealer) has expired. If the user does not reset the timer by pressing the PTT switch, the radio switches to the Emergency mode.

### RX/TX Battery Saver

When engaged, the Receive-mode Battery Saver rapidly pulses the portable on and off, reducing current consumption and extending battery life. If a call is received, the Battery Saver is disengaged, and normal operation resumes. On transmit, the Battery Saver will reduce transmitter power, thus extending operating time, when you are within close range of a strong repeater or dispatch center.

### Programmable Function Keys

Customization of feature access is easily accomplished at the time of programming, thanks to the "programmable" keys that may be assigned functions needed most in your operating environment.



## PC Programmable

All channel and other configuration data may be uploaded to the portable by the dealer in a matter of minutes, allowing efficient setup of a fleet of radios when rapid deployment is required.

## ANI Encoding and Decoding (MDC-1200®, GE-Star®, and DTMF (Encode): optional VME-100 or VMDE-200 required)

Automatic Number Identification, triggered by the pressing of the PTT key, is available in the most popular industry-standard formats, via the optional VME-100 (for Encoding only) or VMDE-200 (for Encoding and Decoding) module.

## DURABLE CONSTRUCTION

### Rugged, Submersible Design

The VX-820 Series portables are housed in an ultra-rugged, impact-resistant case that is designed to exceed U.S. MIL-STD 810C/D/E/F standards for shock, vibration, and driving rain; it also meets international waterproofing standard IP55 (water jets) and IP57 (submersion in water to a depth of 3 feet for up to 30 minutes).



**IP68**  
Super Submersible  
6 feet for 3 hrs

**VX-870 Series**  
Special Order Version

For even more demanding environments, the VX-870 Series version meets IP68 specifications (submersion to 6 feet for 3 hours), and is available via special order.

## Submersible External Speaker/Microphone MH-66 Series (optional)

When operating in an emergency situation where immersion of the radio and/or its accessories could occur, the optional MH-66 Series Speaker/Microphone is rated to the same submersibility specifications as the portable itself (IP57), ensuring that your essential communications won't be interrupted if the microphone gets dropped into the water.



HIGH PERFORMANCE

Power Output: 5 W

The VX-820/870 Series provides up to five solid Watts of transmitter power, for extended communications range. For more localized applications, the power output may be reduced to 2.5 W, 1 W, or 1/4 W, for enhanced battery life.

Wide / Narrow (12.5 / 20 / 25 kHz programmable per channel)

When programming radios for use in different jurisdictions, the VX-820/870 Series portables may be set up, channel by channel, for use in 12.5 kHz, 20 kHz, or 25 kHz channel spacing environments. Deviation and bandwidth are automatically set according to the configuration you choose.

Built-in 5-Tone Signaling

For advanced network or fleet operations, a 5-Tone Encoder-Decoder circuit is included in the VX-820/870 Series. An expensive option on many competing brands, this included feature enhances operation without impacting your budget.

Loud 700 mW Audio Output

Ideal for reception in noisy environments, high-powered audio of the VX-820/870 Series is coupled to a large internal speaker, assuring solid copy throughout difficult crowd control, fire, or sporting-event operations.

Speed Dial (16-key version only)

An easy-to-use DTMF Speed Dialer feature is included in the VX-829/879, for specialized selective calling, telephone interconnect, or other applications.



Voice Storage (Optional DVS-5 required)

The optional DVS-5 Digital Voice Storage Unit allows you to store and play back up to 120 seconds of incoming received audio, so you can archive an important incoming message.

EASY USER INTERFACE

Large LCD (Dot Matrix / 12 Characters +7 Segments / 3 Characters) (VX-829/824/879/874)

The large, easy-to-read display includes a 12-character dot matrix that provides a wealth of information about the operating channel, as well as various status icons. Illuminated using Vertex Standard's renowned Omni-Glow™ back-lighting, the VX-829/ 824/879/874's LCD is clearly visible at night, with minimal degradation of your night vision.



7-Color LED for Incoming Call Alert

The front panel of the VX-820/870 Series includes an ultra-bright LED that can display up to seven different colors, with a variable flash pattern, to alert the operator when a 2-Tone or 5-Tone call has come in, and during Emergency mode operation.



Programmable Home Channel Function

The user may select, out of the dealer-programmed channel list, one channel to be the "Home" channel, which may be assigned to a "programmable" key for one-touch access to a critically-important channel.

Direct Channel Recall (#1 - #4)

Any or all of the programmable keys may be assigned as direct-access one-touch keys for selecting important operating channels.

ARTS™ (Auto-Range Transpond System)

The ARTS™ feature is a "handshake" system that uses DCS coding to confirm that two ARTS™-equipped units are within communication range. If an "out of range" condition develops, an alarm will sound and the communication center can instruct the field unit to move to a better location (or assistance to the field unit can be dispatched).

SECURITY

BCLO / BTLO and TOT

To prevent interference to other users on busy channels, the Busy Channel Lock-Out (BCLO) and Busy Tone Lock-Out (BTLO) features prevent transmission by the portable if the channel is occupied. And the Time-Out Timer (TOT) feature will automatically cut of transmission if the programmed maximum transmit time is exceeded.

Remote Radio Stun / Kill / Revive (5-Tone)

To prevent use of the portable by an unauthorized operator (in case of theft, non-payment of subscription, etc.), a dispatch center can send a 5-Tone command to "Stun" (temporary disabling) or "Kill" (permanent disabling) a unit. If the "Stun" command has been sent, another 5-Tone "Revive" command may also be sent, re-enabling operation of the portable.

Encryption (Optional FVP-35/36 or FVP-25 required)

The FVP-35 and FVP-36 Encryption Units provide security for your important public safety and security communications. A DTMF Paging function is also included in the FVP-25 module, for selective calling.

Other Features

- AF Minimum Volume
- Radio-to-Radio Cloning
- Signal Strength Meter
- Battery Indicator
- Audio Pitch Control

Accessories & Options

VX-820/870/P820/P870 Series

 <p><b>MH-50D7A</b> Speaker/Microphone</p>	 <p><b>MH-66A7A</b> <b>MH-66B7A</b> w/PF key, Toggle Submersible External Microphone</p>	 <p><b>MH-65B7A</b> Submersible External Microphone</p>	 <p><b>VH-121</b> 3-Wire Earpiece, Mic, Palm PTT Switch</p>
 <p><b>VH-131</b> 2-Wire Earpiece, Palm Mic/PTT Combo</p>	 <p><b>VH-111</b> Over the Head, Heavy Duty Headset</p>	 <p><b>FVP-36</b> Inversion Encryption Unit (VX-820/870)</p>	 <p><b>FVP-35</b> Rolling Code Encryption Unit (VX-820/870)</p>
 <p><b>VMDE-200</b> ANI Encoder/Decoder Unit (VX-820/870)</p>	 <p><b>VME-100</b> ANI Encoder Unit (VX-820/870)</p>	 <p><b>FVP-25</b> Encryption/DTMF Pager Unit (VX-820/870)</p>	 <p><b>DVS-5</b> Voice Storage Unit (VX-820/870)</p>
 <p><b>MDC1200</b> Digital ANI Encode Unit (VX-820/870)</p>	 <p><b>VAC-920B/C*</b> Desktop Rapid Charger for FNB-V86LI, FNB-V87LI, FNB-V92LI/IS</p>	 <p><b>VAC-6920B/C*</b> 6-Unit Multi Charger for FNB-V86LI, FNB-V87LI, FNB-V92LI/IS</p>	 <p><b>FBA-34</b> Alkaline Battery Case (6XAA)</p>
 <p><b>FNB-V86LI</b> 7.4 V 1150 mAh Li-Ion Light-Duty Battery</p>	 <p><b>FNB-V87LI</b> 7.4 V 2000 mAh Li-Ion Battery</p>	 <p><b>FNB-V92LI/IS</b> 7.4 V 3000 mAh Li-Ion Battery IS : Intrinsically Safe Version</p>	 <p><b>FIF-10/A</b> USB Programming Interface</p>

- CT-108** PC Programming Cable (for FIF-10/A)
- CT-109** PC Programming Kit (CT-29 + CT-115)
- CT-115** PC Programming Cable (for VPL-1)

- CT-116** Radio to Radio Cloning Cable
- LCC-820** Leather Case
- CE59** Programming Software (for VX-820/870)
- CE76** Programming Software (for VX-P820/P870)

\* B for 120 VAC / C for 230 VAC

Various accessories listed may not be available in some countries.