Vacuum Electron Devices for Industrial Applications

Communications & Power Industries

Eimac division

CPI, Eimac Division is a world leader in the design and manufacture of gridded vacuum electron devices. For 65 years, the EIMAC name has been synonymous with quality. Eimac products are known for robust design and performance, long life, and value.

The products in this catalog are well suited for a wide variety of industrial applications. Whether your application is industrial process heating, plastic welding, laser excitation, analytical instruments, semiconductor processing, or one of numerous other industrial RF requirements, Eimac has rugged, high performance products to meet your need

This catalog is intended for use as a guide in selecting the right Eimac product for your application. Products are divided into categories for RF amplifier and RF oscillator applications. Both triodes and tetrodes are presented for amplifier applications. The bar charts give a graphical means to select tubes based on output power and cooling method. The tables give additional information on each product. Detailed technical information can be accessed on our web site at ***www.eimac.com.*** In addition, Technical Data Sheets for these products are available on request.

Eimac has an Application Engineering group available to assist you with any issues related to the use of our products. We also maintain a Design Engineering group to bring new products to market. We are happy to discuss new product requirements or product modifications that may be needed to make a product that is more suitable for your application.

Our facility, including design, development and manufacturing, is certified to the international quality standard, ISO 9001. We also comply with the requirements of US Military quality standards Mil-I-45208 and Mil-Q-9858. You can be assured of the highest quality products when you select Eimac.

Look to Eimac for rugged, high performance products for your industrial applications. Look to Eimac for continued quality and innovation in power grid vacuum devices.

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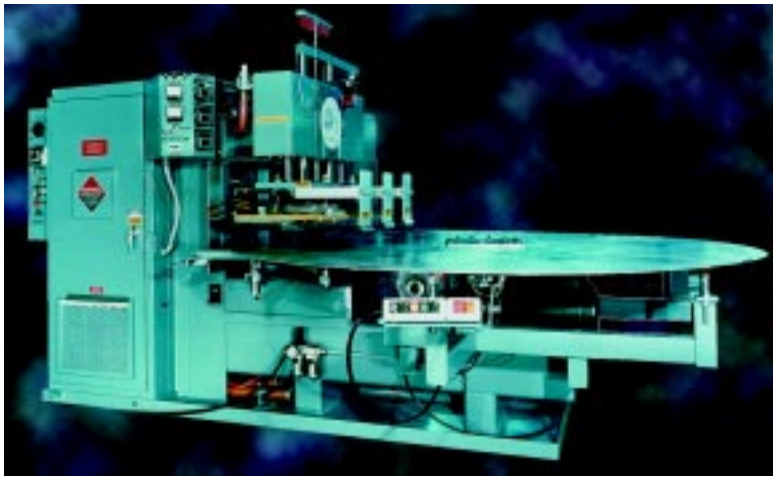
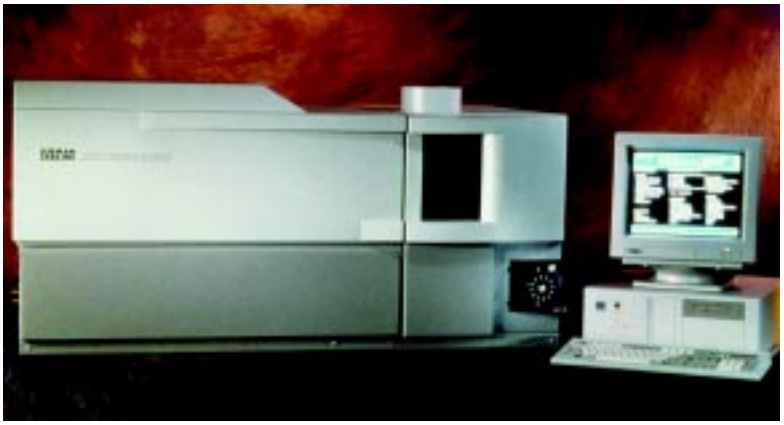
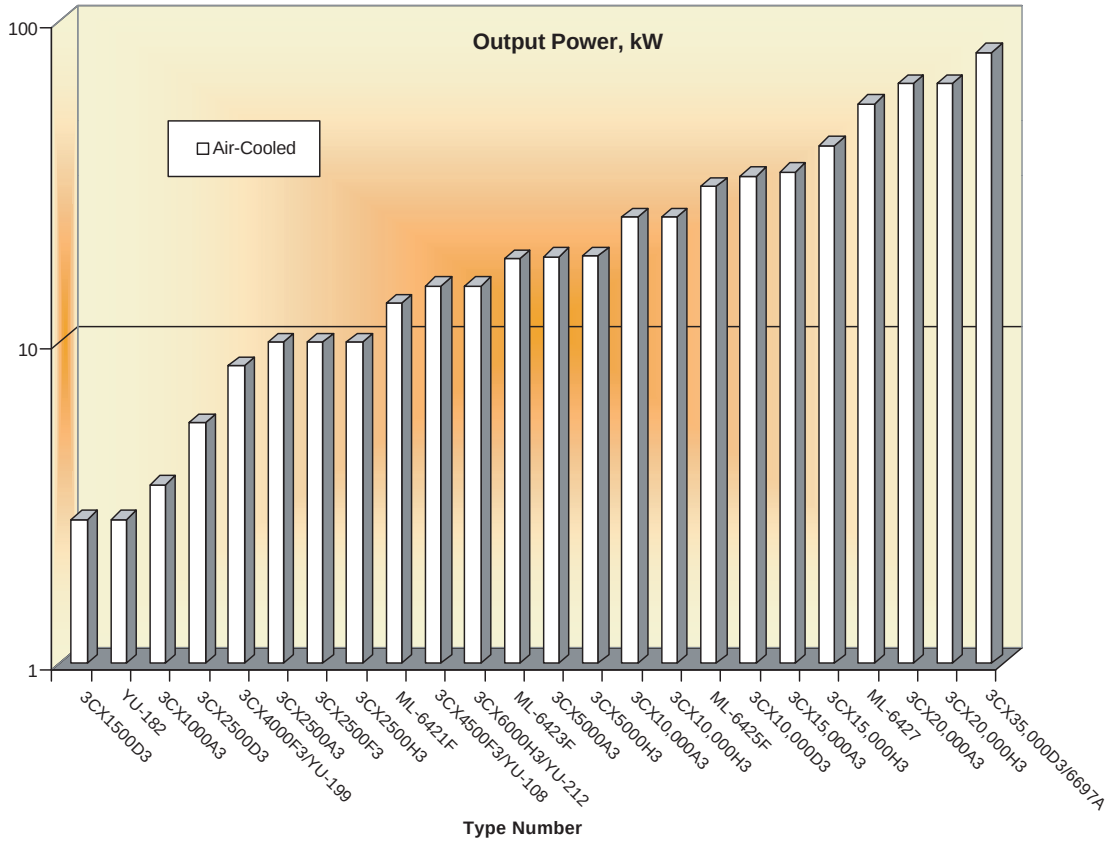


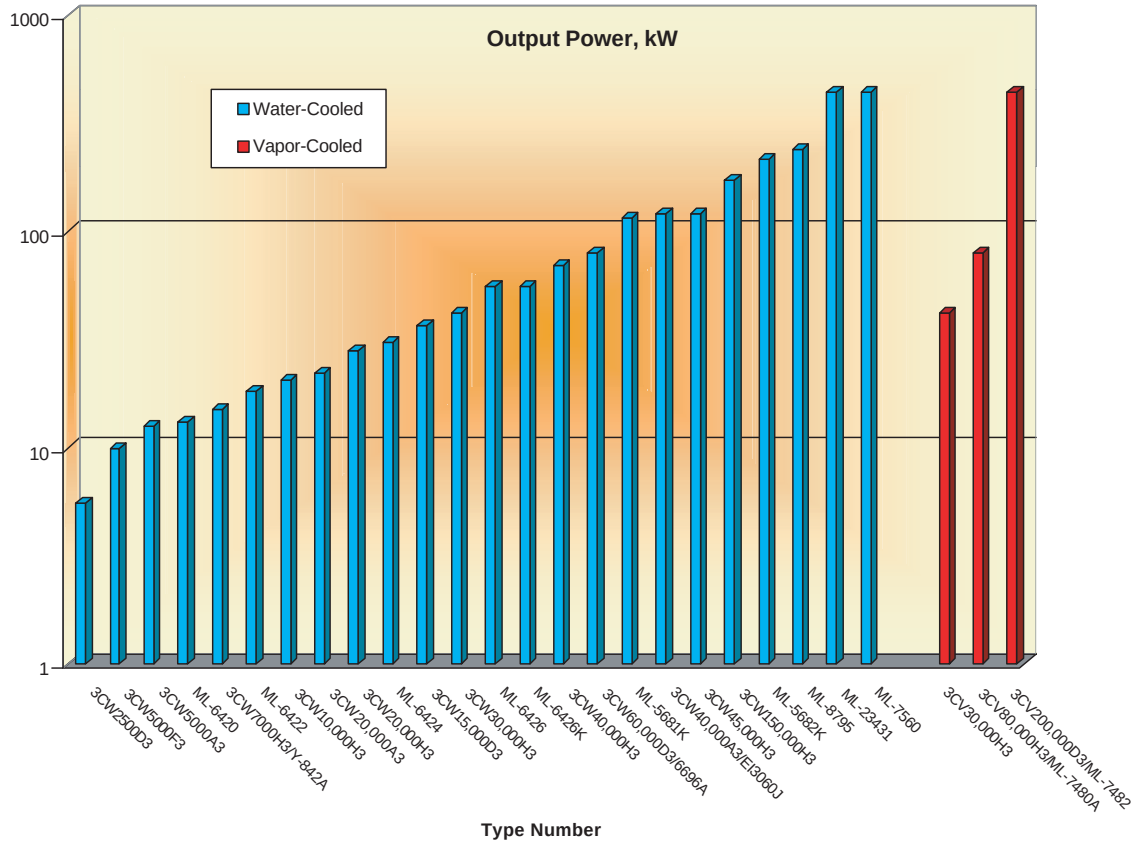


Eimac products are used worldwide in industrial applications

- Analytical Instruments
- Automotive
- Ceramics
- Chemical
- Food Processing
- Laser Excitation
- Medical Products
- Metal Processing
- Paper
- Plastics
- Semiconductor Fabrication
- Textile
- Welding
- Woodworking

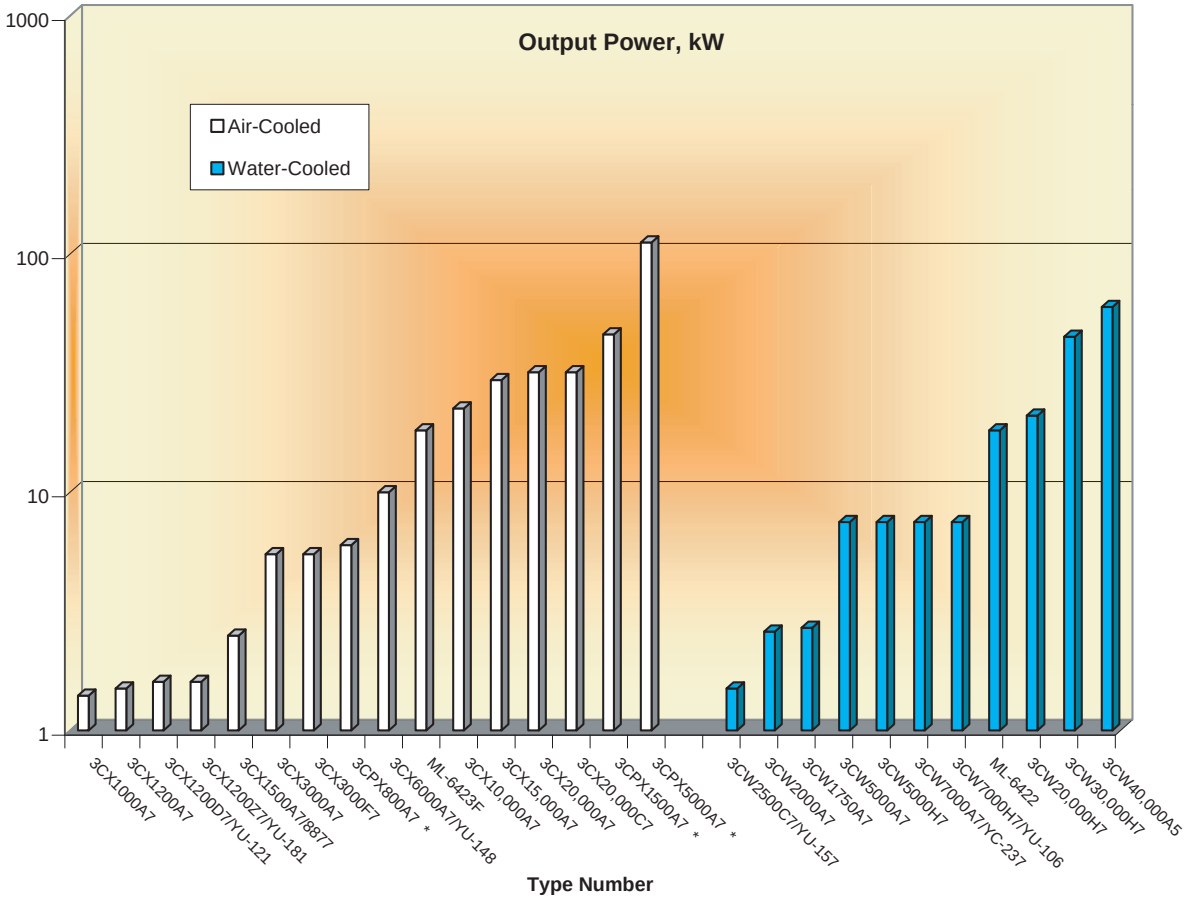
Triodes for Oscillator Applications

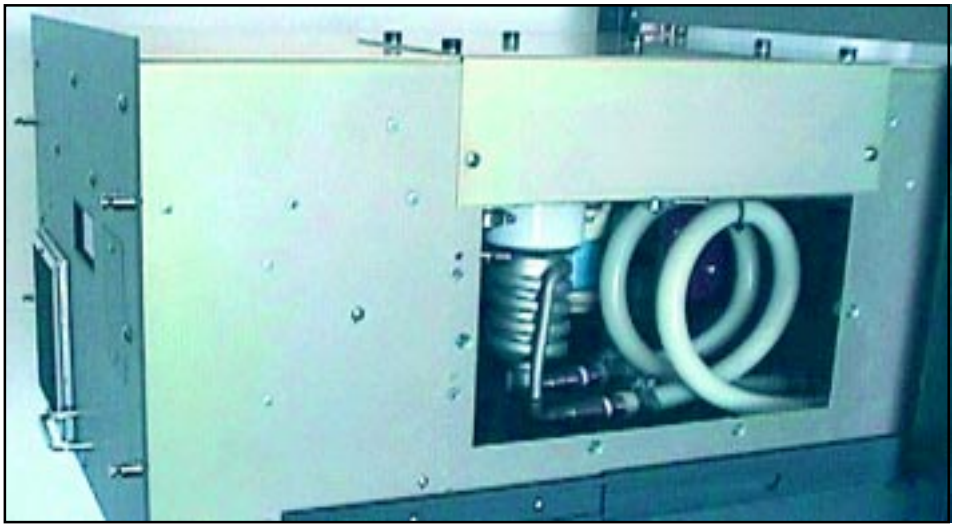




		FILAMENT			MAXIMUM RATINGS					TYPICAL OPERATION		
TYPE NUMBER	COOLING	Volts	Amps	μ	Pp, kW	Pg, W	F_1, MHz	Eb, kV	Ib, A	Eb, kV	Ib, A	Po, kW
3CX1500D3	Air	6.3	25.0	24	1.5	75	110	7.0	0.8	6.0	0.7	2.8
YU-182	Air	6.3	22.0	24	1.5	75	110	7.0	0.8	6.0	0.7	2.8
3CX1000A3	Air	7.5	31.0	24	1	75	75	6.0	1.5	6.0	0.8	3.6
3CW2500D3	Water	7.5	31.0	24	3	75	110	7.0	1.5	6.5	1.1	5.6
3CX2500D3	Air	7.5	32.0	24	2.5	75	110	7.0	1.5	6.5	1.1	5.6
3CX4000F3/YU-199	Air	7.5	52.0	20	4	300	110	6.0	2.5	5.5	1.9	8.43
3CW5000F3	Water	7.5	52.0	22	5	150	30	6.0	2.5	6.0	2.1	10
3CX2500A3	Air	7.5	52.0	22	4	150	110	6.0	2.5	6.0	2.1	10
3CX2500F3	Air	7.5	52.0	22	4	150	75	6.0	2.5	6.0	2.1	10
3CX2500H3	Air	7.5	52.0	20	4	150	75	6.0	2.5	6.0	2.1	10
3CW5000A3	Water	7.5	51.5	22	5	150	75	6.0	2.5	6.0	2.1	12.5
ML-6420	Water	7.0	85.0	20	12.5	375	30	10.0	2.2	9.0	2.0	13.2
ML-6421F	Air	7.0	85.0	20	7.5	375	30	10.0	2.2	9.0	2.0	13.2
3CW7000H3/Y-842A	Water	7.0	78.0	22	7	300	75	9.0	3.0	8.0	2.8	15
3CX4500F3/YU-108	Air	7.0	78.0	22	6	300	75	9.0	3.0	8.0	2.8	15
3CX6000H3/YU-212	Air	7.0	78.0	22	6	300	75	9.0	3.0	8.0	2.8	15
ML-6422	Water	7.0	85.0	90	20	600	30	12.5	2.5	12.0	2.1	18.2
ML-6423F	Air	7.0	85.0	90	10	600	30	12.5	2.5	12.0	2.1	18.2
3CX5000A3	Air	7.5	75.0	18	5	100	110	10.0	3.0	9.0	2.5	18.5
3CX5000H3	Air	7.5	75.0	18	5	150	90	10.0	3.0	9.0	2.5	18.6
3CW10,000H3	Water	7.5	75.0	20	10	150	90	10.0	3.0	9.0	2.9	20.6
3CW20,000A3	Water	7.5	99.0	20	20	250	110	7.0	4.0	7.0	4.0	22
3CX10,000A3	Air	7.5	99.0	20	10	250	140	7.0	4.0	7.0	4.0	24.5
3CX10,000H3	Air	7.5	99.0	20	10	250	90	7.0	4.0	7.0	4.0	24.5
3CW20,000H3	Water	7.5	99.0	20	20	250	90	12.0	4.0	10.0	4.0	28
ML-6424	Water	7.0	120.0	20	20	600	30	12.5	3.5	12.0	3.3	30.6
ML-6425F	Air	7.0	120.0	20	11	600	30	12.5	3.5	12.0	3.3	30.6
3CX10,000D3	Air	5.8	145.0	22	12	350	120	12.0	5.0	10.0	4.3	33
3CX15,000A3	Air	6.3	160.0	20	15	500	100	8.0	6.0	8.0	5.9	34
3CW15,000D3	Water	5.8	145.0	22	15	350	120	12.0	5.0	10.0	4.7	36.8
3CX15,000H3	Air	6.3	160.0	20	15	500	90	12.0	6.0	10.0	5.0	41
3CV30,000H3	Vapor	6.3	160.0	20	30	500	100	10.0	6.0	10.0	6.0	42
3CW30,000H3	Water	6.3	160.0	20	30	500	90	12.0	6.0	10.0	6.0	42
ML-6426	Water	8.0	200.0	20	40	750	30	12.5	8.0	12.0	6.4	55.4
ML-6426K	Water	8.0	200.0	20	40	750	30	12.5	8.0	12.0	6.4	55.4
ML-6427	Air	8.0	200.0	20	20	750	30	12.5	8.0	12.0	6.4	55.4
3CX20,000A3	Air	10.0	160.0	20	20	750	90	12.0	12.0	10.0	7.9	64
3CX20,000H3	Air	10.0	160.0	20	20	750	90	12.0	12.0	10.0	7.9	64
3CW40,000H3	Water	10.0	160.0	20	40	800	90	12.0	9.0	10.0	9.0	70
3CV80,000H3/ML-7480A	Vapor	13.0	205.0	20	80	1000	40	16.0	11.0	15.0	7.0	80
3CW60,000D3/6696A	Water	13.0	205.0	20	60	1000	40	16.0	11.0	15.0	7.0	80
3CX35,000D3/6697A	Air	13.0	205.0	20	35	1000	40	16.0	11.0	15.0	7.0	80
ML-5681K	Water	12.0	220.0	25	75	1500	30	15.0	12.0	14.0	10.5	115
3CW40,000A3/EI3060J	Water	10.0	190.0	22	40	1000	100	14.0	13.0	13.0	12.1	120
3CW45,000H3	Water	10.0	160.0	20	45	1000	75	14.0	11.5	13.0	11.5	120
3CW150,000H3	Water	10.0	312.0	25	150	1500	30	18.0	18.0	16.0	13.0	173
ML-5682K	Water	16.5	325.0	30	140	2000	30	16.0	20.0	15.0	18.4	215
ML-8795	Water	16.5	325.0	40	140	2500	30	20.0	20.0	17.0	19.0	240
3CV200,000D3/ML-7482	Vapor	14.5	450.0	45	200	3000	30	20.0	35.0	20.0	29.0	440
ML-23431	Water	14.5	450.0	45	175	3000	30	20.0	35.0	20.0	29.0	440
ML-7560	Water	14.5	450.0	45	175	3000	30	20.0	35.0	20.0	29.0	440

Triodes for Amplifier Applications

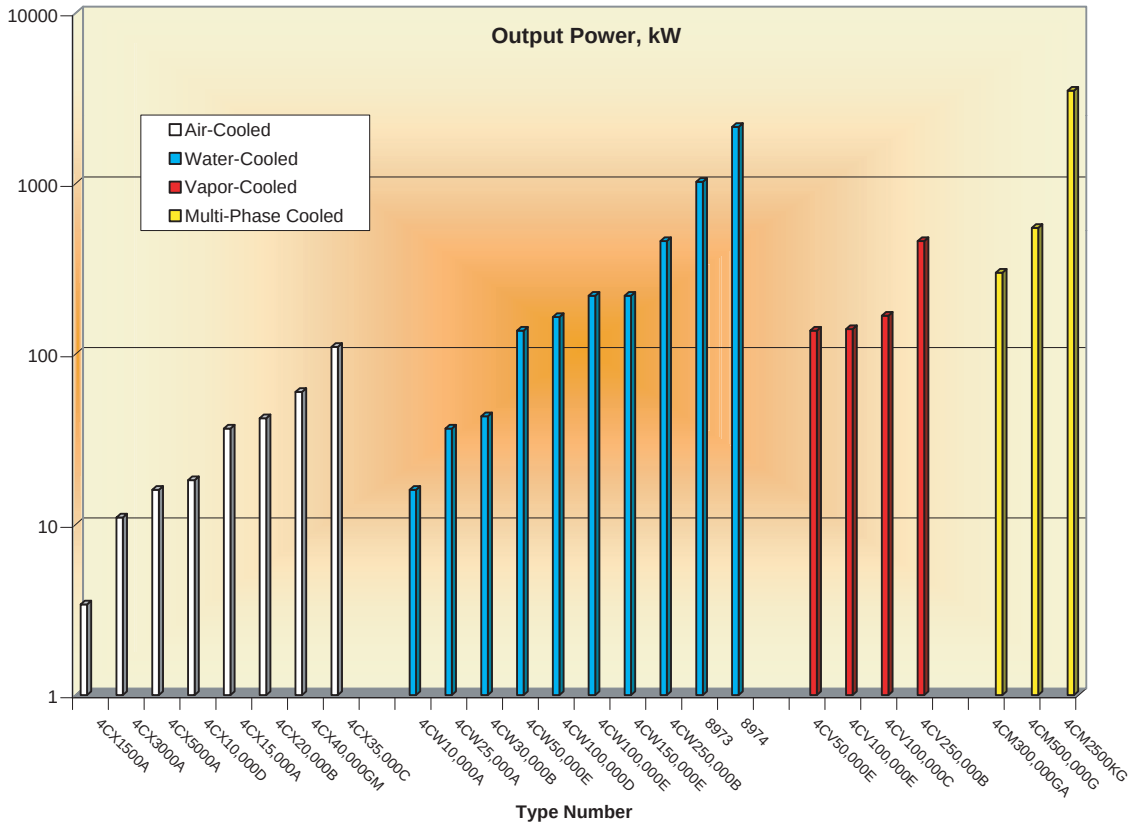




		FILAMENT			MAXIMUM RATINGS					TYPICAL OPERATION		
TYPE NUMBER	COOLING	Volts	Amps	μ	Pp, kW	Pg, W	F_1, MHz	Eb, kV	Ib, A	Eb, kV	Ib, A	Po, kW
3CX1000A7	Air	5.0	30.5	200	1	45	220	3.5	0.7	3.5	0.6	1.4
3CW2500C7/YU-157	Water	5.0	10.5	125	2.5	20	500	4.0	1.0	3.0	1.0	1.5
3CX1200A7	Air	7.5	21.0	200	1.2	50	110	5.0	0.8	3.6	0.7	1.5
3CX1200D7/YU-121	Air	6.3	25.0	200	1.2	50	110	5.5	0.8	4.0	0.6	1.6
3CX1200Z7/YU-181	Air	6.3	25.0	200	1.2	50	110	5.5	0.8	4.0	0.6	1.6
3CX1500A7/8877	Air	5.0	10.5	200	1.5	25	250	4.0	1.0	4.0	1.0	2.5
3CW2000A7	Water	5.0	10.5	200	2	25	250	4.0	1.0	4.0	1.0	2.6
3CW1750A7	Water	7.5	21.3	200	1.75	50	110	5.5	0.9	5.0	0.8	2.7
3CX3000A7	Air	7.5	51.5	160	4	225	110	5.0	2.5	4.8	1.5	5.5
3CX3000F7	Air	7.5	50.5	160	4	225	75	5.0	2.5	4.8	1.5	5.5
3CPX800A7 *	Air	13.5	1.5	200	0.8	4	500	3.5	8.0	3.5	2.5	6.0
3CW5000A7	Water	7.5	51.5	160	5	225	110	5.0	2.5	4.9	2.2	7.5
3CW5000H7	Water	7.5	50.5	160	5	225	75	5.0	2.5	4.9	2.2	7.5
3CW7000A7/YC-237	Water	7.5	51.5	160	5	225	110	5.0	2.5	4.9	2.2	7.5
3CW7000H7/YU-106	Water	7.5	51.5	160	7	225	110	5.0	2.5	4.9	2.2	7.5
3CX6000A7/YU-148	Air	7.0	78.0	200	6	225	110	7.0	3.5	5.7	2.5	10.0
ML-6422	Water	7.0	85.0	90	20	600	30	12.5	2.5	12.0	2.1	18.2
ML-6423F	Air	7.0	85.0	90	10	600	30	12.5	2.5	12.0	2.1	18.2
3CW20,000H7	Water	7.5	99.0	200	20	500	110	7.0	5.0	7.0	4.0	21.0
3CX10,000A7	Air	7.5	99.0	200	10	500	160	8.0	4.0	7.6	3.7	22.5
3CX15,000A7	Air	6.3	160.0	200	15	500	110	8.0	6.0	7.0	5.9	29.6
3CX20,000A7	Air	6.3	160.0	200	20	500	110	10.0	6.0	7.8	5.7	31.9
3CX20,000C7	Air	6.3	160.0	200	20	500	110	10.0	6.0	7.8	5.7	31.9
3CW30,000H7	Water	6.3	160.0	200	30	500	110	12.0	6.0	11.5	5.0	45.0
3CPX1500A7 *	Air	5.5	11.2	200	1.5	25	250	7.5	15.0	7.5	9.2	46.0
3CW40,000A5	Water	12.0	120.0	55	40	1000	90	12.0	9.0	10.0	7.0	60.0
3CPX5000A7 *	Air	15.0	14.0	200	5	35	110	6.5	30.0	6.5	28.5	112.0

***Denotes ratings for pulse applications**

Tetrodes for Amplifier Applications



		FILAMENT			MAXIMUM RATINGS						TYPICAL OPERATION		
TYPE NUMBER	COOLING	Volts	Amps	$\mu(g_1\text{-}g_2)$	Pp, kW	Pg_1, W	Pg_2, W	F_1, MHz	Eb, kV	Ib, A	Eb, kV	Ib, A	Po, kW
4CX1500A	Air	5	38.5	5.5	1.5	25	75	150	5	1	5	0.9	3.4
4CX3000A	Air	9	41.5	5.5	3.5	50	175	150	7	2	7	1.9	11
4CW10,000A	Water	7.5	75	4.5	10	75	250	110	7.5	3	7.5	2.8	16
4CX10,000D	Air	7.5	75	4.5	10	75	250	110	7.5	3.5	7.5	3.2	18.2
4CX5000A	Air	5	90	4.5	5	50	165	220	7.5	3	7.5	2.8	16
4CW30,000B	Water	10	140	6.7	30	200	450	110	12.5	5	12	4.5	43.2
4CW25,000A	Water	6.3	160	4.5	25	200	450	110	10	5	10	4.5	36.5
4CX15,000A	Air	6.3	160	4.5	15	200	450	110	10	6	10	4.6	36.5
4CX20,000B	Air	10	140	6.7	20	200	450	50	12.5	5	11	5	42
4CX40,000GM	Air	15	165	8	40	1000	1500	250	14	10	10.6	7	60
4CX35,000C	Air	10	295	4.5	35	500	1750	50	20	15	19	7	110
4CV50,000E	Vapor	12	215	4.5	50	400	1500	110	17.5	12	15	11.5	137
4CW50,000E	Water	12	215	4.5	50	400	1500	110	17.5	12	15	11.5	137
4CV100,000E	Vapor	15.5	215	4.5	100	500	1750	110	17.5	16	15	11.7	140
4CW100,000D	Water	10	295	4.5	100	500	1750	50	20	15	19	10	165
4CV100,000C	Vapor	10	300	4.5	100	500	1750	50	20	15	17.5	11.8	168
4CW100,000E	Water	15.5	215	4.5	100	500	1750	110	20	16	20	15.2	220
4CW150,000E	Water	15.5	215	4.5	150	500	1750	110	22	20	20	15.2	220
4CM300,000GA	Multi-Phase	18	430	4.3	300	2000	5000	50	13	50	11	36	300
4CV250,000B	Vapor	12	660	4.5	250	1500	3500	50	20	40	19	32.5	460
4CW250,000B	Water	12	660	4.5	250	1500	3500	50	20	40	19	32.5	460
4CM500,000G	Multi-Phase	23	500	4.4	500	3000	8000	50	15	75	12.5	54	550
8973	Water	16.3	600	4.5	1000	2000	7500	110	22.5	65	21	59	1025
8974	Water	2 x 16.3	600	4.5	1500	4000	15000	50	22.5	125	21.5	125	2150
4CM2500KG	Multi-Phase	15.5	640	6	2500	8000	20000	200	27	190	24	182	3500

Symbols & Definitions

Symbol	Definition
*	Ratings are for Pulse Applications
A	Ampere
Amp	Ampere
Eb	DC Anode Voltage
F_1	Highest Frequency for Maximum Ratings
Ib	DC Anode Current
kV	Kilovolt
kW	Kilowatt
m	Amplification Factor
MHz	Megahertz
Pg_1	Control Grid Dissapation
Pg_2	Screen Grid Dissapation
Po	Output Power
Pp	Anode Dissapation
W	Watt

Application photographs used in this catalog have been provided by the following companies:

ASTeX
Cosmos
Henry Radio
Leeman Labs
PSC
Stalam
Varian

The History of Eimac

Eimac was founded in November 1934 by Bill Eitel and Jack McCullough, and has been dedicated to the concept of building the best in gridded vacuum electron devices since that time. Eimac was a pioneer in the development of the Industrial Market with the introduction of the 100TL in the late 1930's. By the early 1940's, Eimac was selling products into such markets as plastic bonding, plywood bonding, heat treating of metals, and induction brazing. As the industry grew and diversified, Eimac became involved in additional applications such as chemical processing, paper drying, textile drying, welding, food processing, and many others.

Eimac has continued to introduce new products, advancing the state-of-the-art with innovations to raise power levels and operating frequencies, improve efficiency, and increase the flexibility of application. Eimac has developed proprietary coatings for grid wire, pyrolytic graphite grids, and innovative air and water-cooling techniques, all directed towards improving the performance and reliability of their products. This continued innovation has led to new applications, including Industrial Lasers, Analytical Instruments, and Semiconductor Fabrication systems.

The current industry emphasis worldwide is on reducing EMI and meeting more stringent regulatory standards. Amplifier circuits provide a better technical approach than the traditional oscillator circuits in meeting these standards. Eimac now offers a wide range of robust, high gain triodes and tetrodes that are well suited for amplifier service in industrial environments.

Eimac continues to demonstrate its commitment to industry with ongoing improvement in quality, performance, and ruggedness of products along with the continued introduction of new products. With this direction, Eimac offers the broadest range of quality products available in the marketplace today.