ARTS Energy Selector guide

ARTS ENERGY

Advanced Rechargeable Technology and Solutions

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ARTS Energy, your trusted partner for reliable, intelligent and eco-friendly rechargeable battery systems

Why are ARTS Energy rechargeable battery systems the optimal solution ?

ARTS Energy : a global leader in high quality rechargeable batteries

With its long-term experience in producing batteries, we have unequalled expertise in designing, developing and manufacturing robust and reliable cells and battery systems.

ARTS Energy focuses on business applications

We are totally focused on delivering products and solutions designed for business applications and adapted to the specific needs of a wide range of users.

ARTS Energy : more than a mere supplier, we are your partner

If you cannot find the answer to your needs from our standard offer, we can conceive, design and produce a customised solution that will do the job. We will combine your team's strengths with ours to create and manufacture a purpose-built battery system for your unique requirements, designed to cost.

ARTS Energy is global

In the battery industry, most manufacturing and assembly is done manually in the Far East. ARTS Energy is the only industrial company still located in Europe, with state-of-the-art, fully automated factory in Nersac, and ARTS Energy also has battery assembly capabilities in the United States.

ARTS Energy controls the process from design to delivery

ARTS Energy designs, produces and delivers its products. Because we control and supervise the entire end-to-end value chain, we have a seamless view on quality. In addition, we meet your everincreasing requirements for higherpower and higher-energy battery solutions through continuous and heavy investment in research and development. We are constantly looking for more innovative and efficient solutions.

ARTS Energy makes intelligent batteries

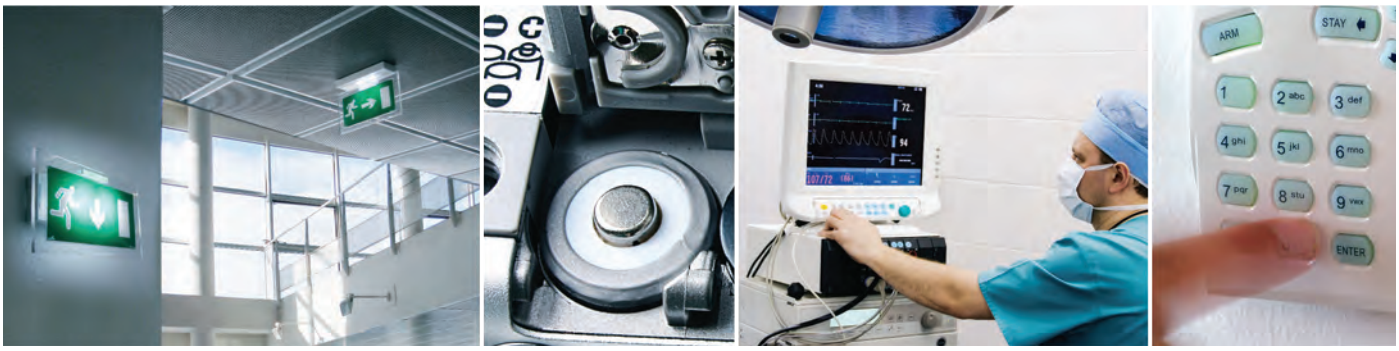
When you choose ARTS Energy, you get more than just a battery. You also get our highly advanced and innovative battery system. The technological expertise we pack inside each battery delivers an intelligent turnkey solution. Your battery communicates with other applications, controls its own charge and discharge and is pre-programmed to do what has to be done... A timesaver enabling you to focus on your core business.

ARTS Energy works hard to protect the environment

As an industry pioneer in eco-designed products, ARTS Energy is dedicated to building batteries that meet the goals of sustainable development. When your rechargeable batteries have to be replaced, ARTS Energy works through several national collection and recycling organisations to provide you with an easy-to-use collection and treatment service. Most importantly, ARTS Energy factory strictly complies with all environmental regulations concerning air, water, ground and solid waste standards.

ISO 9001
ISO 14001
BUREAU VERITAS
Certification

A battery to fit every application, specification and need



ARTS Energy comprehensive product range includes standard and purpose built battery systems composed of Nickel-Cadmium, Nickel Metal-Hydride and Li-ion technologies, all using ARTS Energy 's intelligent engineering design and state-of-the-art battery management solutions. You will find ARTS Energy batteries in...

Buildings and industrial plants
Alarms, UPS, back-up systems and more.

Emergency and security systems
Exit signs, emergency fixtures, conversion kits, alarms and more.

Personal mobility
E-bikes, e-scooters, underwater scooters, electrical wheelchairs, lift systems for disabled persons and other personal electric vehicles.

Professional tools
Construction, agriculture, gardening and many other professional tools.

Professional electronics
Vacuum cleaners, personal care equipment, handheld terminals, audio and video equipment, flashlights, diving and mine lamps and more.

Medical
Drug dispensers, cardiac defibrillators, respirators, homecare ventilators, medical carts, monitoring and diagnosis equipment and more.

Military and defence
Robots, portable radio communication equipment and more.

Marine
Signalling, UPS, back-up systems and more.

Small off-grid PV applications
Street lighting, signage, water supply and irrigation, weather stations, sensors, navigation aids, rural electrification PV, professional applications.

Telecommunications
Cellular and cordless phones, personal communication systems, private mobile radios, back-up systems for telecom networks and more.

		Building & industrial plants	Emergency & security systems	Professional mobility	Professional tools	Professional electronics	Medical	Military & defence	Marine	Small off-grid PV applications	Telecom-munications
Ni-Cd	VRE				■	■	■	■	■		■
	VSE					■	■	■			■
	VT	■	■				■				
	VNT	■	■								
	VNT U	■	■								
	VST	■	■								
	ecolife	■	■								
Ni-MH	VH			■	■	■	■	■	■		■
	VHT	■	■			■	■			■	■
	VHT U	■	■								

Ni-Cd batteries

Ni-Cd battery Standard & High Energy
VRE / VSE series

ARTS Energy VRE standard Ni-Cd series were originally designed for cycling applications requiring a rapid charge. However, they are also suited for a wide range of applications where they offer an excellent cost / performance ratio.
The high level of reliability provided by ARTS Energy's standard series is time-tested and well-proven, with hundreds of millions of units delivered over years. ARTS Energy's VSE high energy Ni-Cd series benefit from significant technological upgrades compared with standard series. The VSE design features advanced nickel foam electrode technology to meet the fast charge and increased capacity needs of light and compact equipment.

	ARTS Energy type		IEC capacity at 0.2C rate		Standard charge (16h)	Quick or fast charge		Typical internal impedance	Max. dimensions for bare cells		Typical weight
	Nominal voltage 1,2 volts/cell	Top	Typical [mAh]	Minimum [mAh]	Current [mA]	Current [mA]	Time [h]	[mOhm]	Diameter [mm]	Height [mm]	[g]
VRE	VRE AA 700	L	780	700	70	700	1	14	14.0	49.3	21
	VRE Cs 1600	L	1600	1500	150	1500	1	5	22.2	42.2	48
	VRE Cs 1800	L	1800	1700	170	1700	1	5	22.2	42.2	49
	VRE C	L	2550	2300	230	2300	1	5	25.3	49.5	75
	VRE 1/2 D	L	2550	2400	240	800	2-3	10	32.2	36.6	80
	VRE D	L & H	5100	4500	450	4500	1	4	32.2	58.6 / 60.3	140
	VRE D 5500	L	5500	5000	500	5000	1	4	32.2	58.6	150
	VRE F	L	8800	8000	800	8000	1	4	32.2	89.2	220
VSE	VSE AA	L	980	940	94	940	1	16	14.0	49.3	22

High Temperature
VT / VST / VNT / VNT U / ARTS Energy ecolife series

ARTS Energy's high temperature Ni-Cd series are perfectly suited to emergency and security equipment applications in compliance with International (IEC 61951), US (UL 924) and Japanese (JISC 8705) standards.
They are designed to accept a permanent charge (C/20 to C/15) for a minimum of four years in high temperature environments (up to + 40° C / 104° F).

Higher-end versions of the cells, such as the «U» and «70» models, can even withstand a constant temperature of up to + 55° C / 131° F with a similar life expectancy when permanently charged. The VNT / VNT U series benefit from ARTS Energy's innovative PNE (Plastic bonded Nickel Electrode) technology which provides improved energy density and an excellent resistance to cold weather conditions.

ARTS Energy ecolife series serve your emergency lighting project with their greatly reduced environment impact and their greatly extended service life of 8 years. A product Life Cycle Assessment is carried out on all the following phases: raw material extraction, manufacturing, distribution and use.
A Product Environmental Profile (PEP) is available upon request.

	ARTS Energy type		IEC capacity at 0.2C rate		Standard charge (16h)	Permanent charge		Typical internal impedance	Max.dimensions for bare cells		Typical weight
	Nominal voltage 1.2 volts/cell	Top	Typical [mAh]	Minimum [mAh]	Current [mA]	Current [mA]	Time [h]	[mOhm]	Diameter [mm]	Height [mm]	[g]
VT	VT 1/2 D (1)	L	2500	2200	220	110	-	10	32.2	36.8	80
	VT F (1)	H	7500	7000	700	350	-	5	32.2	91.1	196
	VT F 70 (2)	L	7700	7000	700	350	-	5	32.2	89.2	196
VST	VST AA (1)	L	860	800	80	40	-	30	14.0	49.3	26
VNT	VNT CS (1)	L	1650	1600	160	80	-	8	22.2	42.2	45
	VNT D (1)	H	4250	4000	400	200	-	6	32.2	60.3	115
VNT U	VNT Cs U (2)	L	1650	1600	160	80	-	8	22.2	42.2	45
	VNT C U (2)	L	2650	2500	250	125	-	8	25.3	49.5	75
	VNT D U (2)	H	4250	4000	400	200	-	6	32.2	60.3	115
	VNT D U HC (2)	H	4500	4200	420	200	-	6	32.2	60.3	124
ARTS Energy ecolife	ecolife AA (1)	L	650	600	60	30	-	30	14.0	49.3	26
	ecolife Cs (1)	L	1570	1500	150	75	-	8	22.2	42.2	45
	ecolife D (1)	H	4250	4000	400	200	-	6	32.2	60.3	115

(1) Up to + 40°C temperature environment

(2) Up to + 55°C temperature environment



Ni-MH batteries

Super High Energy and High Energy Back-up
VH / VHT / VHT U series

ARTS Energy's VH super high energy and VHT long life back-up Ni-MH series are designed for professional applications that demand fast charge and discharge capability over a prolonged lifetime. VH Cs, VH D and VH F are designed specifically for high energy density applications requiring fast charge and high discharge rate (50 A) and target cordless power tools, personal mobility and many other professional applications. The VHT series have been engineered for very long life (1000 - 2000 cycles) in extreme range of temperatures and target back-up, medical, small off-grid photovoltaic and other applications requiring cycles. The VHT U series are designed for + 55°C ELU applications.

	ARTS Energy type		IEC capacity at 0.2C rate		Standard charge (16h)	Quick or fast charge		Typical internal impedance	Max.dimensions for bare cells		Typical weight
	Nominal voltage 1.2 volts/cell	Top	Typical [mAh]	Minimum [mAh]	Current [mA]	Current [mA]	Time [h]	[mOhm]	Diameter [mm]	Height [mm]	[g]
VH	VH AAA	L	680	650	65	650	1	50	10.5	43.7	13
	VH AA 1500	L	1500	1400	140	1400	1	20	14.0	49.3	26
	VH AA 1700	L	1700	1600	160	1600	1	20	14.0	49.3	26
	VH 4/3 A	L	3750	3700	370	2000	1-2	20	17.0	67.0	53
	VH Cs 3200 XL	L	3200	3000	300	3000	1-2	4	22.0	42.7	58
	VH D 9500 XP	L	9500	9000	900	5000	2-3	3	32.2	58.6	168
	VH F XP	L	15300	14500	1500	5000	3-4	3	32.2	89.2	252
VHT	VHT AA 800	L	840	800	80	270	3	19	14.0	49.3	22
	VHT AA	L	1150	1100	110	370	3	18	14.0	49.3	24
	VHT Cs	L	2200	2000	200	670	3	5	22.0	42.7	48
	VHT 7/5 Cs	L	4200	4000	400	1330	3	20	22.0	60.0	74
	VHT D	L	6450	6000	600	2000	3	4	32.2	58.6	135
	VHT F	L	11000	10000	1000	3350	3	5	32.2	89.2	215
VHT U	VHT AA U	L	1150	1100	110	intermittent charge		18	14.0	49.3	24
	VHT Cs U	L	2200	2000	200	intermittent charge		5	22.0	42.7	48
	VHT 7/5 Cs U	L	4200	4000	400	intermittent charge		20	22.2	60.0	74

Battery systems

Ni-Cd & Ni-MH
standard battery systems

ARTS Energy offers Ni-Cd & Ni-MH standard battery systems addressing all professional and industrial portable applications.
As well as the electrical and mechanical interfaces, these systems usually include management, control and communication capabilities, plus the charger. Parallel assemblies and intelligent battery design are used to achieve high-capacity systems.
Special management algorithms implemented in proprietary electronics bring optimised performance, long shelf and service life, guaranteed user safety and extended warranty conditions. Battery and system design benefit from ARTS Energy's extensive experience in rapid prototyping, design-to-cost and volume production.
As well as making standard battery systems addressing most needs, ARTS Energy also develops custom systems to client specifications. Wherever possible, custom batteries are designed and made using standard components and subassemblies.
ARTS Energy's standard offer consists of modules in ABS plastics (Smart modules), whose assembly has been adapted to robust and easily-connecting designs in aluminum casings. ARTS Energy VH modules are specially designed for personal mobility applications. Smart VHT modules address small off-grid PV applications, back-up power systems and professional electronics requiring unsurpassed long life energy storage.

	Smart VH module								Mobility module					
	VH D			VH F					VH D		VH F			
	10S	20S	30S	10S	20S	30S	10S2P	20S2P	20S	30S	20S	30S	10S2P	20S2P
Electrical characteristics														
Minimal voltage (V)	12	24	36	12	24	36	12	24	24	36	24	36	12	24
Typical capacity (Ah)	9	9	9	15	15	15	30	30	9	9	15	15	30	30
Energy (Wh)	108	216	324	180	360	540	360	720	216	324	360	540	360	720
Specific energy (Wh/kg)	51	57	58	58	64	68	64	67	44	49	55	56	55	59
Energy density (Wh/l)	83	104	113	107	126	134	126	139	85	95	104	113	102	117
Mechanical characteristics														
Height (mm)	99	159	219	129	219	309	219	395	170	228	231	320	235	410
Length (mm)	178	178	178	178	178	178	178	178	185	185	185	185	185	185
Width (mm)	73.5	73.5	73.5	73.5	73.5	73.5	73.5	73.5	81	81	81	81	81	81
Weight (kg)	2.1	3.8	5.6	3.1	5.6	8.0	5.6	10.7	4.9	6.6	6.5	9.6	6.5	12.3
Volume (l)	1.3	2.1	2.9	1.7	2.9	4.0	2.9	5.2	2.5	3.4	3.5	4.8	3.5	6.1

	Smart VHT module							PV module				Extensolar			
	10S	20S	20S	30S	30S	10S2P	20S2P	20S	30S	10S2P	20S2P	10S2P	20S	20S2P	30S2P
Electrical characteristics															
Minimal voltage (V)	12	24	24	36	36	12	24	24	36	12	24	12	24	24	36
Typical capacity (Ah)	10	6	10	6	10	20	20	10	10	20	20	20	10	20	20
Energy (Wh)	120	144	240	216	360	240	480	240	360	240	480	240	240	480	720
Specific energy (Wh/kg)	44	53	50	53	52	50	52	44	44	44	44	40	40	44	46
Energy density (Wh/l)	71	69	84	77	89	84	93	69	75	69	78	52	52	66	78
Mechanical characteristics															
Height (mm)	129	158	219	217	309	219	395	231	320	231	410	300	300	475	650
Length (mm)	178	178	178	178	178	178	178	185	185	185	185	Diameter : 140			
Width (mm)	73.5	73.5	73.5	73.5	73.5	73.5	73.5	81	81	81	81				
Weight (kg)	2.7	2.7	4.8	4.1	6.9	4.8	9.2	5.5	8.1	5.5	10.8	6.0	6.0	11.0	15.5
Volume (l)	1.7	2.1	2.9	2.8	4.0	2.9	5.2	3.5	4.8	3.5	6.1	4.6	4.6	7.3	10.0

As part of its ongoing commitment to advanced technology systems, ARTS Energy has developed a strong expertise in developing, qualifying and manufacturing customised integrated Li-ion battery systems. The specific characteristics of Li-ion cells require well adapted battery management and control systems. Charge and discharge control, application interfacing, communication and safety are to be considered as a whole and need to be optimised for a given application and operating conditions.
For more details on the offer, please contact ARTS Energy.

ARTS Energy is committed to the highest standards of environmental stewardship

As part of its environmental commitment, ARTS Energy gives priority to recycled raw materials over virgin raw materials, reduces its plant's air and water releases year after year, minimizes water usage, reduces fossil energy consumption and associated CO_2 emissions, and ensures that its customers have recycling solutions for their spent batteries. Regarding industrial batteries, ARTS Energy has had partnerships for many years with collection companies in most EU countries, in North America and in other countries. This collection network receives and dispatches our customers batteries at the end of their lives to fully approved recycling facilities, in compliance with the laws governing trans-boundary waste shipments.

ARTS Energy has selected a recycling process for industrial lithium-ion cells with very high recycling efficiency. A list of our current collection points is available on our web site. In other countries, ARTS Energy assists users of its batteries in finding environmentally sound recycling solutions. Please contact your sales representative for further information.

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