



# Magnesium™ Soil Anodes



## High Potential Magnesium

SuperMag High Potential Magnesium Anodes from Galvotec Alloys, Inc. offers typical high working driving potentials of -1.70 volts or better vs. copper/copper sulfate reference electrode, providing more current output per pound than AZ-63 alloy magnesium anodes. This alloy is the best choice for engineered systems in high resistivity soils.



### Laboratory- Testing

Our modern laboratory is equipped with the best state of the art equipment available. Our technicians and inspectors are well trained and experienced. A Chemical Analysis is provided for every heat. Each heat is analyzed throughout production to insure consistency. Electrochemical testing is performed routinely on randomly selected heats as a quality assurance procedure, utilizing the ASTM-G-97 test method.



### Production - Quality Control

Our production facilities offer the best possible working environment available in the industry. Our personnel are experienced in all phases of the foundry operation. Quality Control in our foundry begins on the foundry floor, where the first line of inspection is the casting and molding crew, our lab technicians, inspectors and managers completes the quality team. Our quality control staff carefully monitors raw material, core materials, packaging and all aspects of production. Laboratory and field investigations prove that Galvotec SuperMag anodes perform consistently.

### Packaging- Availability

Anodes are supplied in backfill to meet the customers' specifications. The typical backfill material consists of 75% gypsum, 20% bentonite and 5% sodium sulfate. Standard sizes and shapes are warehoused. Anodes are available packaged and unpackaged with or without leads as per customers' specifications.



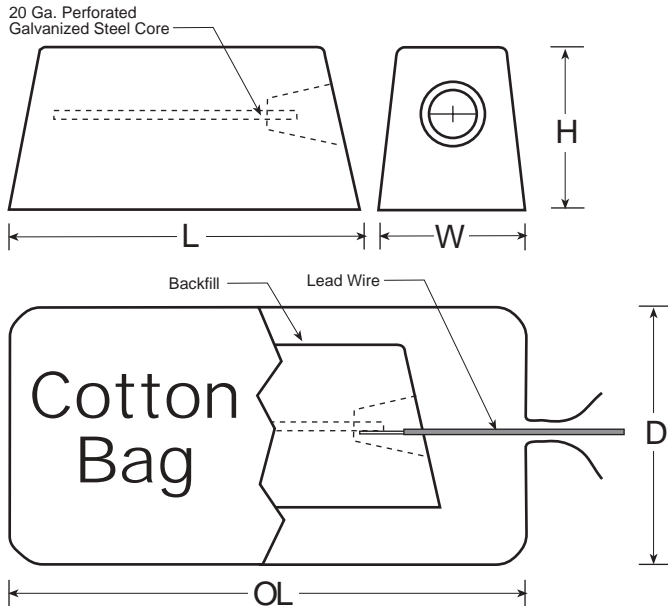
# Magnesium H-1 Soil Anodes



Galvotec Alloys produces the H-1 Alloys, ASTM AZ63.  
The standard sizes can be found in the following chart.

PRODUCT NO.	Weight				Anode Dimensions									
	BARE		PKDG.		Width (W)		Height (H)		Length (L)		Diameter (D)		Overall Length (OL)	
	lbs	kg	lbs	kg	in	mm	in	mm	in	mm	in	mm	in	mm
GA-MG-3 H-1	3	1.4	8	3.6	3	76	3	76	5.0	127	5.25	133	8.00	203
GA-MG-5 H-1	5	2.3	13	5.9	3	76	3	76	8.0	229	5.25	133	11.25	286
GA-MG-9 H-1	9	4.1	27	12.2	3	76	3	76	14.0	336	5.25	133	20.00	508
GA-MG-12 H-1	12	5.4	32	14.5	4	102	4	102	12.0	305	7.50	191	18.00	457
GA-MG-17 H-1	17	7.7	45	29.4	4	102	4	102	17.0	432	7.50	191	24.00	610
GA-MG-32 H-1	32	14.5	68	30.8	5	127	5	127	20.5	521	8.50	216	28.00	711
GA-MG-50 H-1	50	22.7	100	45.4	7	178	7	178	16.0	406	10.00	254	24.00	610

## Other shapes, sizes and weights available on request.



Packaged Anodes are prepack in either bags or cardboard cartons in low resistivity, quick wetting, prepared backfill consisting of 75% hydratred gypsum, 20% bentonite, and 5% sodium sulphate.



Connecting Wire: Standard 10 feet of solid or stranded #12 AWG Copper Lead Wire/THWN/THNN.

Alloy Compositions			
	Grade "A"	Grade "B"	Grade "C"
Element	%	%	%
Aluminum	5.3 - 6.7	5.3 - 6.7	5.0 - 7.0
Zinc	2.5 - 3.5	2.5 - 3.5	2.0 - 4.0
Manganese (Min)	0.15	0.15	0.10
Impurities			
Iron (Max.)	0.003	0.003	0.003
Nickel (Max.)	0.002	0.003	0.003
Copper (Max.)	0.02	0.05	0.10
Silicon (Max.)	0.10	0.30	0.30
Other (Max.)	0.30	0.30	0.30
Magnesium	Balance	Balance	Balance

## Typical Electrochemical Properties

Amps/Hrs./Lb.	500-540
Efficiency	50-54%
Closed Circuit Potential (Copper/Copper Sulfate)	-1.45 to -1.55v
Open Circuit Potential (Copper/Copper Sulfate)	-1.50 to -1.60v

NOTE: While statements contained herein are believed to be accurate, they are offered as suggestions only and no warranty or representation is intended. Galvotec Alloys products are sold subject to the terms and conditions appearing on our printed order acknowledgment.



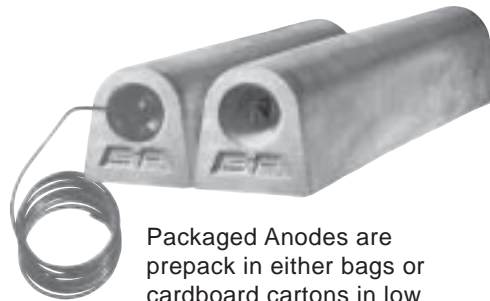
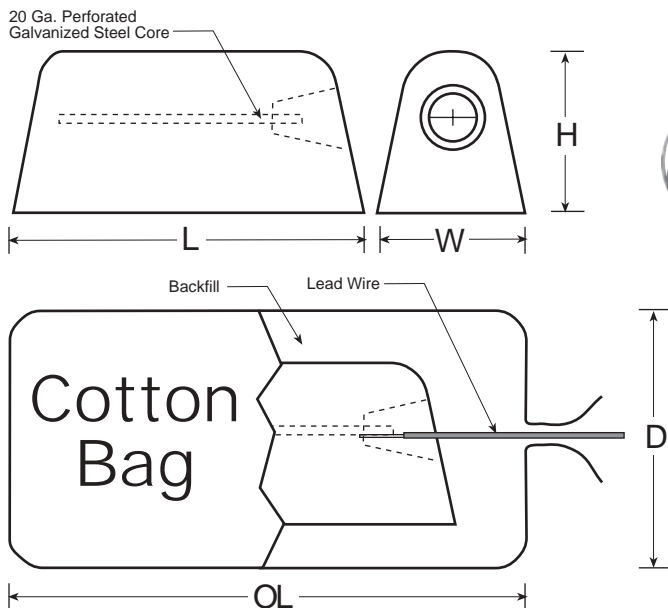
# Magnesium SuperMAG™ High Potential Anodes



Galvotec Alloys produces High Potential anodes under our trademark SuperMAG™. Chemical analysis and potential tests are performed on every heat.

PRODUCT NO.	MODEL NO.	Weight				Anode Dimensions									
		BARE		PKDG.		Width (W)		Height (H)		Length (L)		Diameter (D)		Overall Length (OL)	
		lbs	kg	lbs	kg	in	mm	in	mm	in	mm	in	mm	in	mm
GA-MG-3 HP	3D3	3	1.4	8	3.6	3.50	89	3.75	95	5.00	127	6.0	152	10	254
GA-MG-5 HP	5D3	5	2.3	17	7.7	3.50	89	3.75	95	8.50	216	6.0	152	12	305
GA-MG-9 HP	9D3	9	4.1	27	12.2	3.50	89	3.75	95	14.00	356	6.0	152	17	432
GA-MG-17 HP	17D3	17	7.7	45	20.4	3.50	89	3.75	95	25.75	654	7.5	191	34	864
GA-MG-20 HP	20D2	20	9.1	70	31.8	2.75	70	3.00	76	59.75	1518	5.0	127	66	1676
GA-MG-32 HP	32D5	32	14.5	70	31.8	5.50	140	5.00	127	20.50	521	8.0	203	28	711
GA-MG-32 HP	32D3	32	14.5	91	41.3	3.50	89	3.75	95	45.25	1149	6.5	165	53	1346
GA-MG-40 HP	40D3	40	18.1	96	43.5	3.50	89	3.75	95	59.75	1518	6.5	165	66	1676
GA-MG-48 HP	48D5	48	21.8	100	45.4	5.50	140	5.75	146	31.00	787	8.0	203	38	965
GA-MG-60 HP	4x4x60	60	27.2	125	56.7	4.00	102	4.00	102	60.00	1524	7.0	178	64	1626

Other shapes, sizes and weights available on request.



Packaged Anodes are prepack in either bags or cardboard cartons in low resistivity, quick wetting, prepared backfill consisting of 75% hydrated gypsum, 20% bentonite, and 5% sodium sulphate.

Connecting Wire: Standard 10 feet of solid or stranded #12 AWG Copper Lead Wire/THWN/THNN.



### Typical Electrochemical Properties

Amps/Hrs./Lb.	500-580
Efficiency	50-58%
Closed Circuit Potential	-1.50 to -1.75v
Open Circuit Potential	-1.70 to -1.78v

Alloy Compositions	
Element	%
Aluminum (Max.)	0.01
Manganese (Min)	0.50 - 1.30
Iron (Max.)	0.03
Nickel (Max.)	0.001
Copper (Max.)	0.02
Other (Max.)	0.30
Magnesium	Balance

**For the very best in Magnesium Anodes – specify SuperMAG™.**

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# Magnesium Hull Anodes



Our experience in producing galvanic anodes assures that you will receive top quality anodes that will effectively inhibit corrosion when used in a properly designed and maintained cathodic protection system.

Galvotec's magnesium anodes are produced in a variety of shapes and sizes for use in seawater, brackish water and fresh water cathodic protection systems.

**Composition:** Galvotec's magnesium anodes conform in composition to the requirements of U.S. Government Specification MIL-A-21412A (Ships). This 6% aluminum, 3% zinc alloy (AZ-63) usually provides the best combination of economy and operating characteristics in seawater or brackish water.

**Galvanic Efficiency:** The current efficiency of Galvotec's magnesium anodes is nominally 55% in seawater and the current capacity is about 550 amp-hr./lb. The open circuit potential of the magnesium alloy used is nominally -1.55 volts to a copper/copper sulfate half cell in seawater; the driving voltage to galvanized steel is about 0.70 volts providing a relatively high current output per anode. Both hull and condenser anodes are available with a plastisol (polyvinyl chloride) coating which serves as an excellent current barrier shield.

**Applications:** Magnesium anodes are effective and economical corrosion fighters that for over 25 years have been protecting a variety of steel structures in salt, brackish and fresh water, including:

- Hulls of ships, barges, tugs and boats
- Ballast tanks of ore carriers and similar vessels
- Bulkheads
- Water storage tanks
- Piers and pilings
- Pipelines
- Heat exchangers
- Travelling screens

This brochure contains general specifications on the wide variety of magnesium anodes produced by Galvotec. For further information, or to discuss your specific requirements, contact our sales office.



# Magnesium

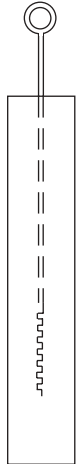


## Pier Anodes

**Pipe** – 3/4" standard galvanized steel pipe core extending 1" beyond ends.

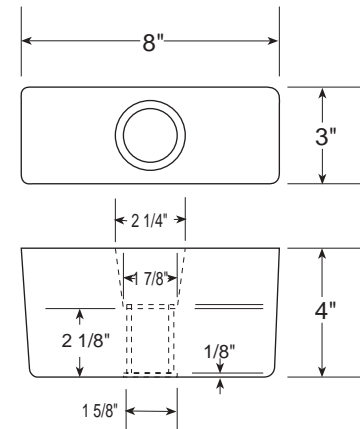
**Eyebolt** – 1/2" galvanized steel eyebolt core; 3/4" eyebolt in 200 lb. size.

Product Number	Nom. Wt.		Cylinder Dia.		Length		Core Type (Specify on order)
	lb.	kg	in	mm	in	mm	
<b>GA-MG-P-50C</b>	50	22.7	8	203	16	406	Pipe or Eyebolt
<b>GA-MG-P-100C</b>	100	45.4	8	203	32	813	Pipe or Eyebolt
<b>GA-MG-P-200C</b>	200	90.7	12	305	27	686	Pipe or Eyebolt

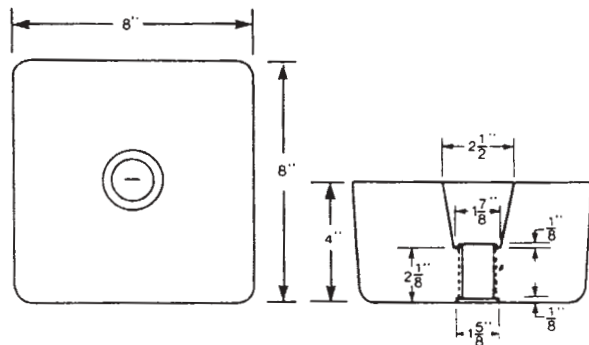


## Condenser Anodes

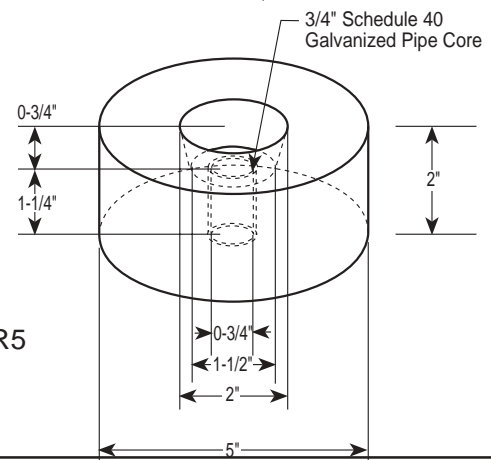
The GA-MG-15-S has a nominal weight of 15 pounds with a 3/4" galvanized steel pipe core. This anode can be furnished either bare or with a plastisol coating. When ordering, please specify with or without coating.



GA-MG-6SX



GA-MG-7.5-S  
Same as above except 2" thick.



GA-MG-2R5

Product Number	Nom. Wt.		Cylinder Diam.		Length		Core Type
	lb.	kg	in	mm	in	mm	
<b>GA-MG-2R5</b>	2.5		5	127	2	51	Pipe Core
<b>GA-MG-1R5</b>	1.25		5	127	1	25	Pipe Core



# Magnesium Hull Anodes



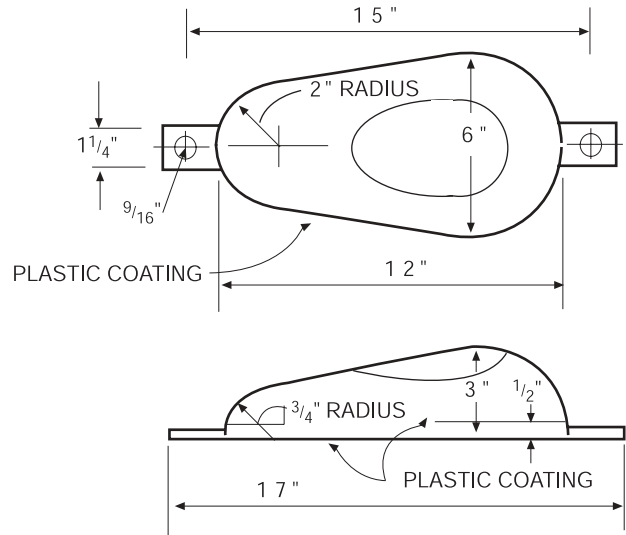
(With Plastisol Coating)

## GA-MG-10 Launch

Weighs about 10 lbs. (4.5 kg)

Contains cast-in galvanized steel strap with  $\frac{9}{16}$ " holes for mounting.

Straps  $\frac{1}{4}$ " x  $1\frac{1}{4}$ "  
(6 mm x 32 mm)

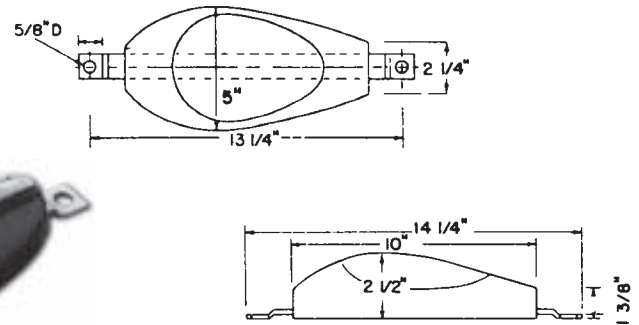


## GA-MG-5 Launch

Weighs about 5 lbs. (2.3 kg)

Contains cast-in galvanized steel strap with  $\frac{5}{8}$ " (16 mm) holes for mounting.

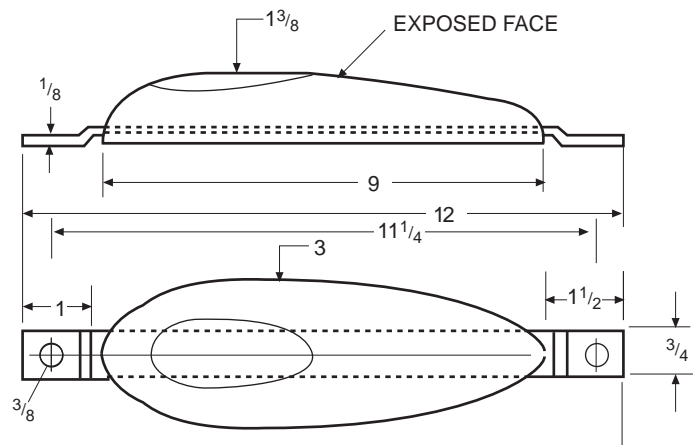
Widely used on steel hull service boats.



## GA-MG-JR

A teardrop-shaped anode.

Weighs about 1.5 lbs. (0.7 kg)





# Magnesium Hull Anodes



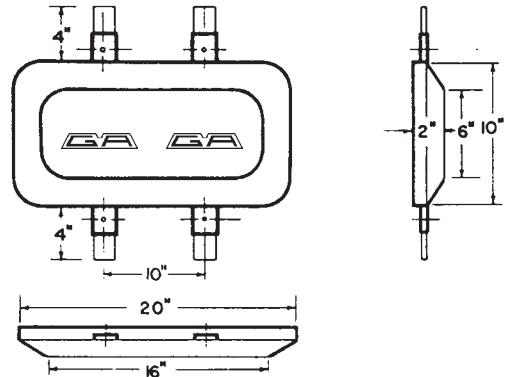
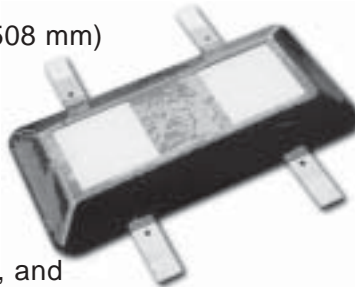
(With Plastisol Coating)

## GA-MG-H-22

Popular barge anode weighing about 22 lbs (10.0 kg).  
10" x 2" x 20" (254 mm x 50 mm x 508 mm)

Contains two cast-in 1/4" x 1 1/2" (6 mm x 38 mm) galvanized steel straps that are easily welded to the steel hull structure.

Plastisol coating on the sides, ends, and faying surfaces acts as a current barrier shield.

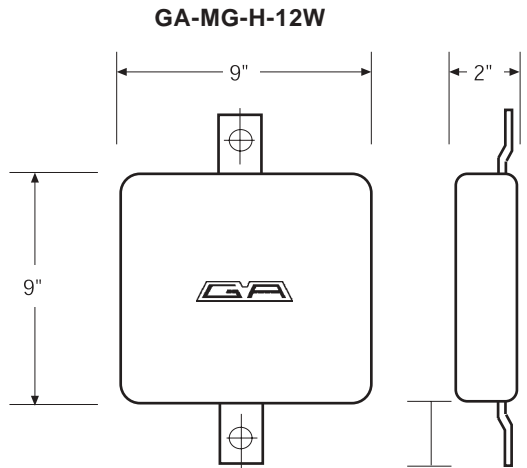


## GA-MG-H-12W

Weighs about 12 lbs (5.4 kg).  
9" x 2" x 9" (229 mm x 50 mm x 229 mm)

Contains one cast-in 1/4" x 2" (6 mm x 51 mm) galvanized steel strap with 3/4" (19 mm) mounting holes.

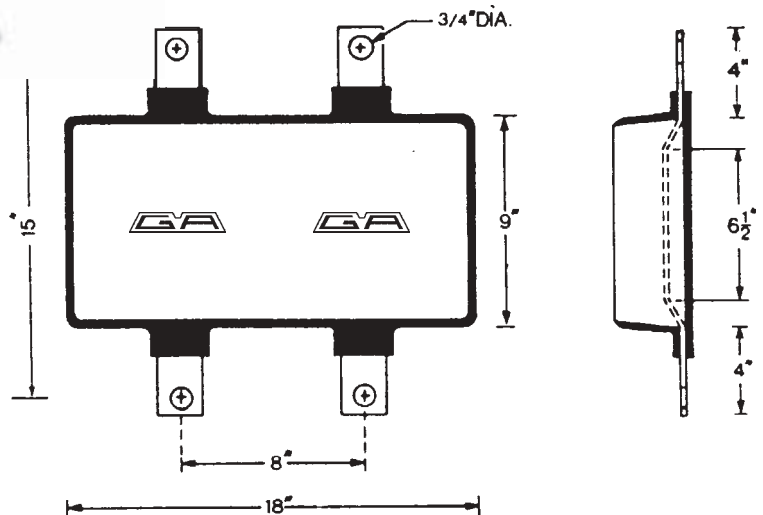
GA-MG-H-24W



## GA-MG-H-24W

9" x 2" x 18"  
(229 mm x 50 mm x 458 mm)  
Weighs about 24 lbs (10.9 kg) and contains two cast-in 1/4" x 2" (6 mm x 51 mm) galvanized steel straps. Mounting holes 3/4" (19 mm) in diameter are provided. Plastisol coated.

GA-MG-H-24W



## GA-MG-H-44W

9" x 4" x 18" (229 mm x 100 mm x 458 mm)  
Weighs about 44 lbs (20.0 kg) and contains two cast-in 1/4" x 2" (6 mm x 51 mm) galvanized steel straps. Mounting holes 3/4" (19 mm) in diameter are provided. Plastisol coated.

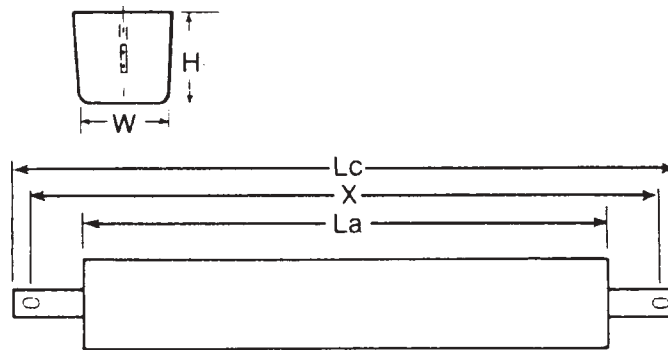


# Magnesium Tank Anodes

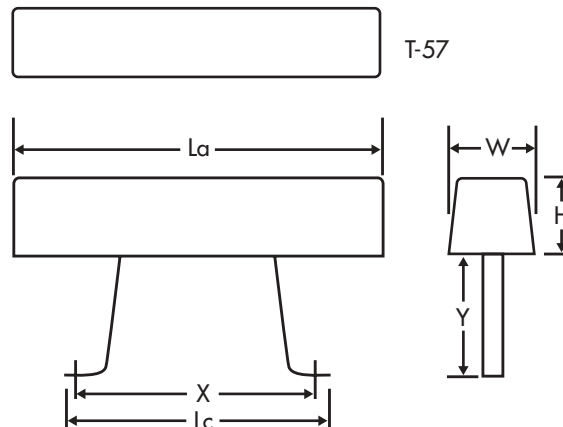


In this series the anodes contain cast-in, longitudinal, galvanized steel cores  $1/4" \times 11/2"$ . Two elongated mounting holes  $11/16" \times 11/2"$  are provided.

Product Number	Nom. Wt.		W		H		La		Lc		X	
	lbs	kg	in	mm	in	mm	in	mm	in	mm	in	mm
<b>GA-MG-T-36</b>	36	16.3	4	102	4	102	28	711	38	965	36	914
<b>GA-MG-T-52A</b>	52	23.6	5	127	5	127	29	737	38	965	36	914
<b>GA-MG-T-53</b>	53	24.0	7	178	7	178	16	406	24	610	22	559



Product Number	Nom. Wt.		W		H		La		Lc		X		Y	
	lbs	kg	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
<b>GA-MG-T-57</b>	57	25.9	7	178	7	178	16	406	21	533	19	483	8	203



Data on other tank anode sizes, weights and core configurations available on request.