EaglePicher

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Silver Zinc Battery Designs

Manually Activated Design Principles

The design of a manually activated silver-zinc system is intended to provide a battery having maximum energy with minimum weight and volume which can be stored for a period of time and then readied for use by the manual introduction of electrolyte. The principle components are the electrodes, the separator system, the cell housing and the electrolyte. The advantage of the single cell housing is that a wide range of designs can be obtained by the tailoring of individual components to satisfy any configuration requirement. The chemical elements used include a porous silver plate oxidized to the divalent state coupled with a specially prepared sponge zinc plate. The electrolyte employed is a solution of potassium hydroxide in water.

Practically any material capable of restraining the cells and enduring the dynamic environments can be utilized to house the number of cells required for the intended use. The most popular are stainless steel, titanium and fiberglass. Containers can be fabricated and welded, molded or machined depending on need.

For use in extremely cold environments, thermostat-controlled heater systems are employed. These can be designed to heat the battery to a temperature compatible with the voltage level desired. Depending on the application, voltage can be supplied to the heater from either an external source or from the battery.

This system is capable of undergoing extreme conditions of shock, acceleration, vibration and is operable at all altitudes and is especially adaptable for airborne equipment, missiles and spacecraft.

Click the battery number in the below figure to obtain the technical data sheet for that particular battery.

Manually Activated Silver Zinc (AgZn) Batteries				
Battery Number	**Voltage**	**Capacity (amp-hrs)**	**Rate (amps)**	**Wet Stand Time (months)**
MAP-4142-19, -21, -23, -27	20-37	100-150	65-100	1-3
MAP-4176	28	4	0-16	1
MAP-4269-3	22-34	1.0	0.12-20.0	0.5
MAP-4482-3	26-32	50	0.25-27	3
MAP-4497	5.6-8	0.3-1.5	0.12	1
MAP-4507	Multiple	Multiple	Multiple	None

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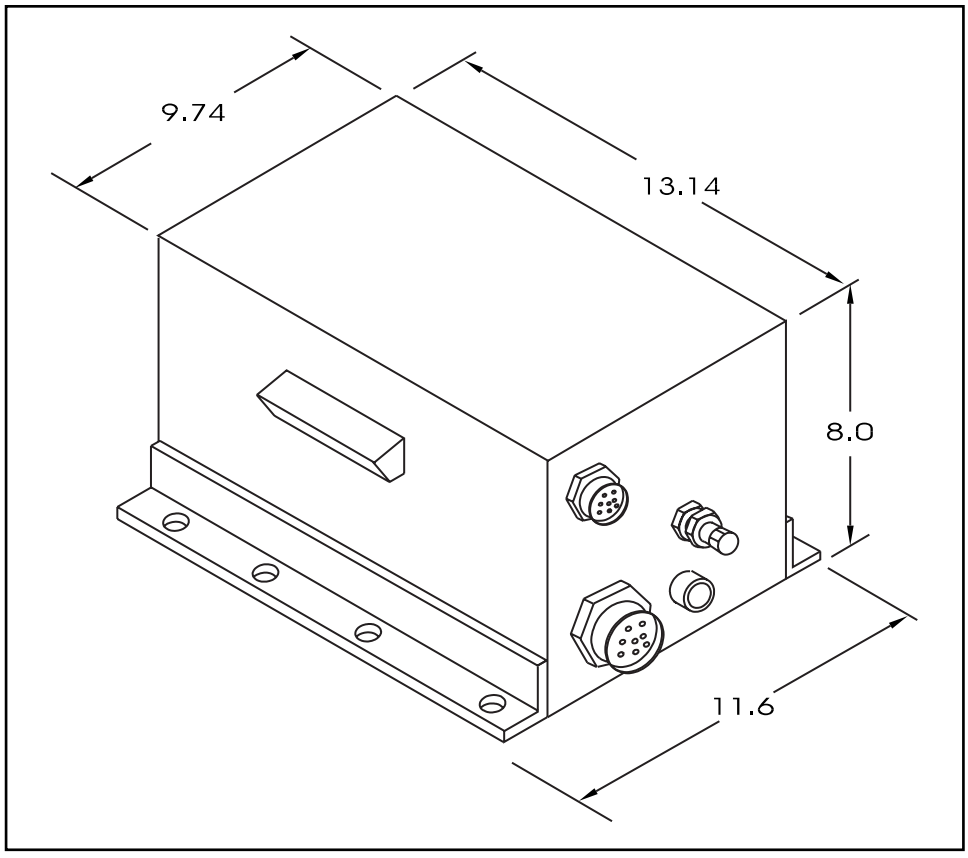
Manually Activated Silver Zinc (AgZn) Batteries (Continued)				
Battery Number	**Voltage**	**Capacity (amp-hrs)**	**Rate (amps)**	**Wet Stand Time (months)**
MAP-4528-3	28	0.5	1.0	3
MAP-4557	28	25-40	8-120	1
MAP-4565	26-32	85	5-50	3
MAP-4570-5	28	250	20-90	2
MAP-4573-3	28	4.8	2-28	3
MAP-4592	56	70	64-175	7
MAR-4494	28	11.7	1.0-14	3
MAR-4504	25	675	1.5	6
MAR-4545-3	28	3	0.5-3.3	5
MAR-4546-3	28	20	5-27	5
MAR-4554	6.0	40	4-15	12
MAR-4572	6.0	15	4	12
MAR-4574	28	2	1.0-9.0	5
MAR-4575	28	8	0.1-1.0	5
MAR-4577-3	28	11.7	1.0-14	3
MAR-4585	28	555	1-120	9
SZHR-25	1.5	25	25	6
SZHR-25-5	1.5	40	20	6
SZHR-50	1.5	50	50	6
SZLR-160	1.5	160	15	12

MODEL MAP-4142-19 /-23/-21/-27

MODEL MAP-4142	-19	-23	-21	-27
Voltage	20-37			
Capacity (amp-hrs)	100	100	150	150
Rate (amps)	65-100			
Weight (lbs)	75	69	85	76
Volume (in^3)	1381	1165	1381	1300
Temperature	40-100°F			
Heater	54 ohms to 115 VAC			100 Watts 28 VDC
Max. Heater Time	1 Hour			4 Hours
Max. Activation	4 Hours			48 Hours
Max. Stand Time	30 Days	30	30	60 Days



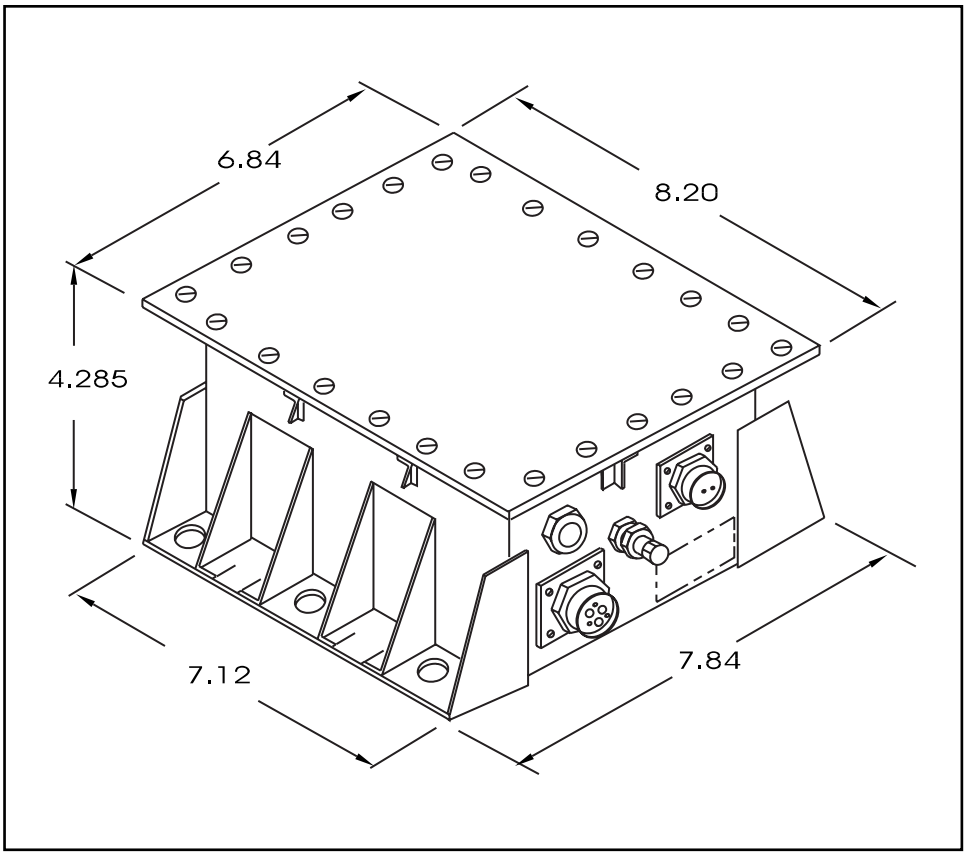
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAP-4176

Voltage	28
Capacity (amp-hrs)	4
Rate (amps)	0-16
Weight (lbs)	14.5
Volume (in^3)	208
Temperature	-35-110°F
Heater	28 V 200 Watts
Max. Heater Time	N/A
Max. Activation	N/A
Max. Stand Time	30 Days



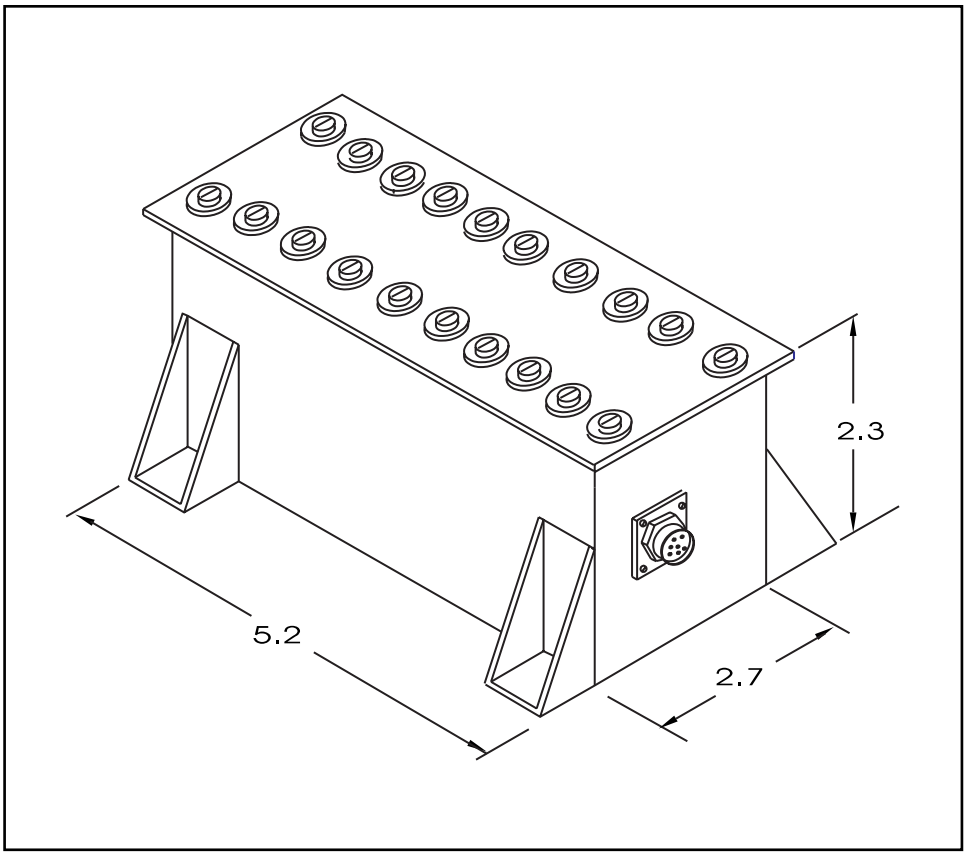
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAP-4269-3

Voltage	22-34
Capacity (amp-hrs)	1.0
Rate (amps)	0.12-20.0
Weight (lbs)	2.5
Volume (in^3)	32.3
Temperature	0-100°F
Heater	115 VAC 30 Watts
Max. Heater Time	1 Hour
Max. Activation	4 Hours
Max. Stand Time	15 Days



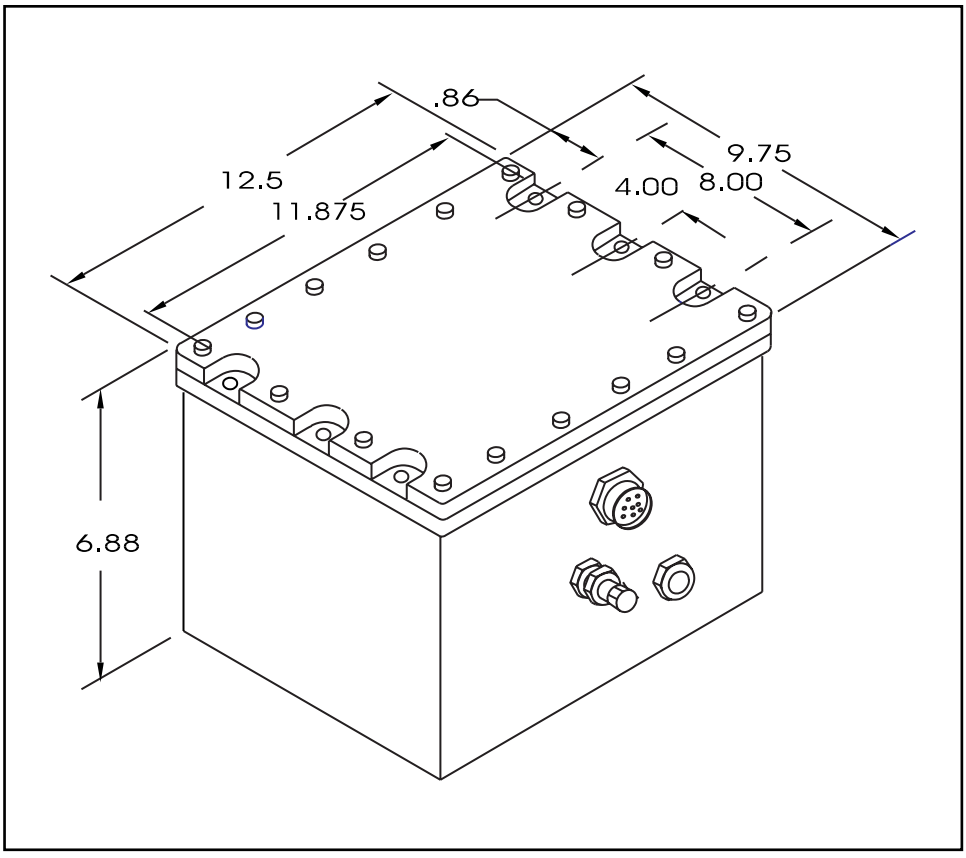
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAP-4482-3

Voltage	26-32
Capacity (amp-hrs)	50
Rate (amps)	.25-27
Weight (lbs)	45
Volume (in^3)	665
Temperature	33-105°F
Wet Stand Time	90 Days



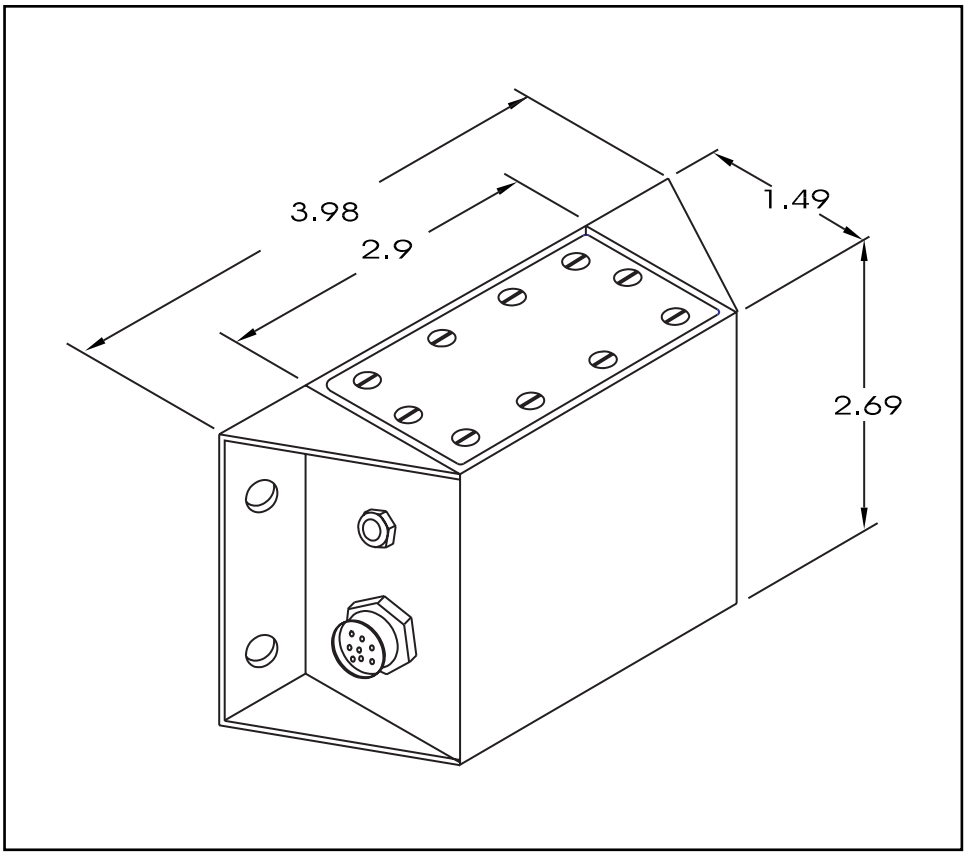
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAP-4497

Voltage	5.6-8.0
Capacity (amp-hrs)	0.30-1.5
Rate (amps)	0.12 S.S. w/6.0 A Surge
Weight (lbs)	1.5
Volume (in^3)	16
Temperature	30-100°F
Heater	N/A
Max. Heater Time	N/A
Max. Activation	N/A
Max. Stand Time	30 Days at R.T.



Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAP-4507

	Output		(Amps)
Section	Volts	Amp-Hrs	Rate
1A	38	2	100
1B	50	2	100

Voltage _____ 38 to 50

Capacity (amp-hrs) _____ 4

Rate (amps) _____ 100

Weight (lbs) _____ 50

Volume (in^3) _____ 684

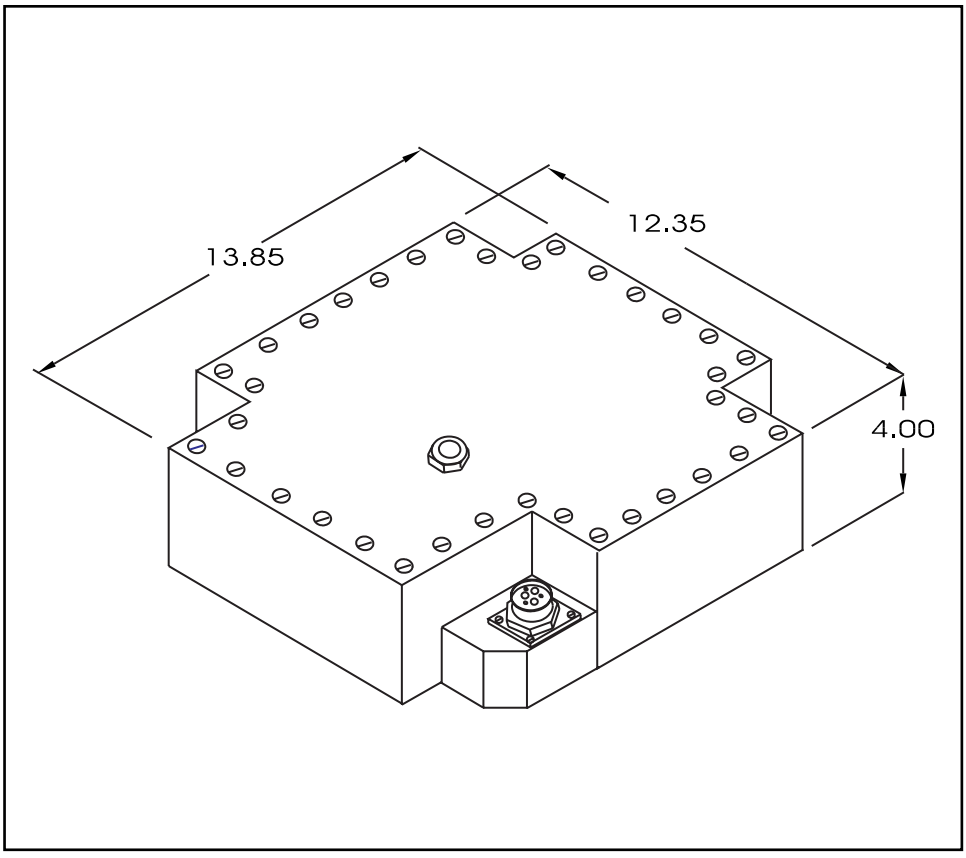
Temperature _____ 90°F

Heater _____ 115 VAC 315 Watts

Max. Heater Time _____ N/A

Max. Activation _____ N/A

Max. Stand Time _____ 30 Days



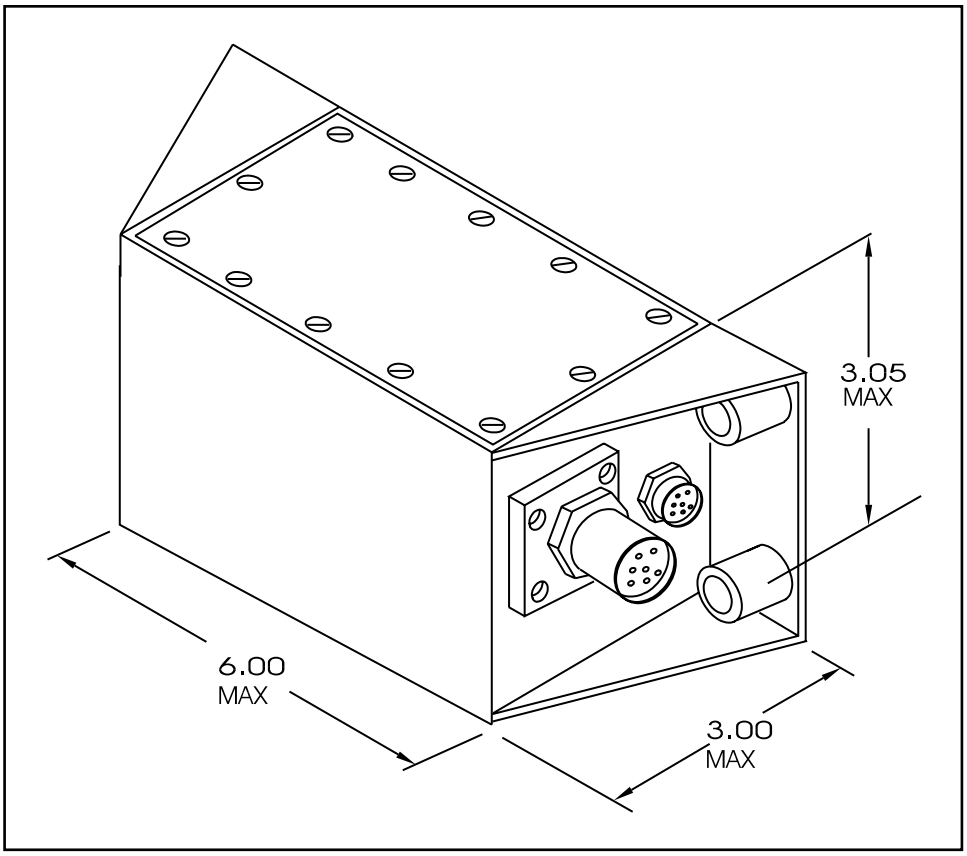
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAP-4528-3

Voltage	28
Capacity (amp-hrs)	.5
Rate (amps)	1 w/10 A. Surge
Weight (lbs)	3.0
Volume (in^3)	55
Temperature	60-80°F
Heater	None
Wet Stand Time	90 Days



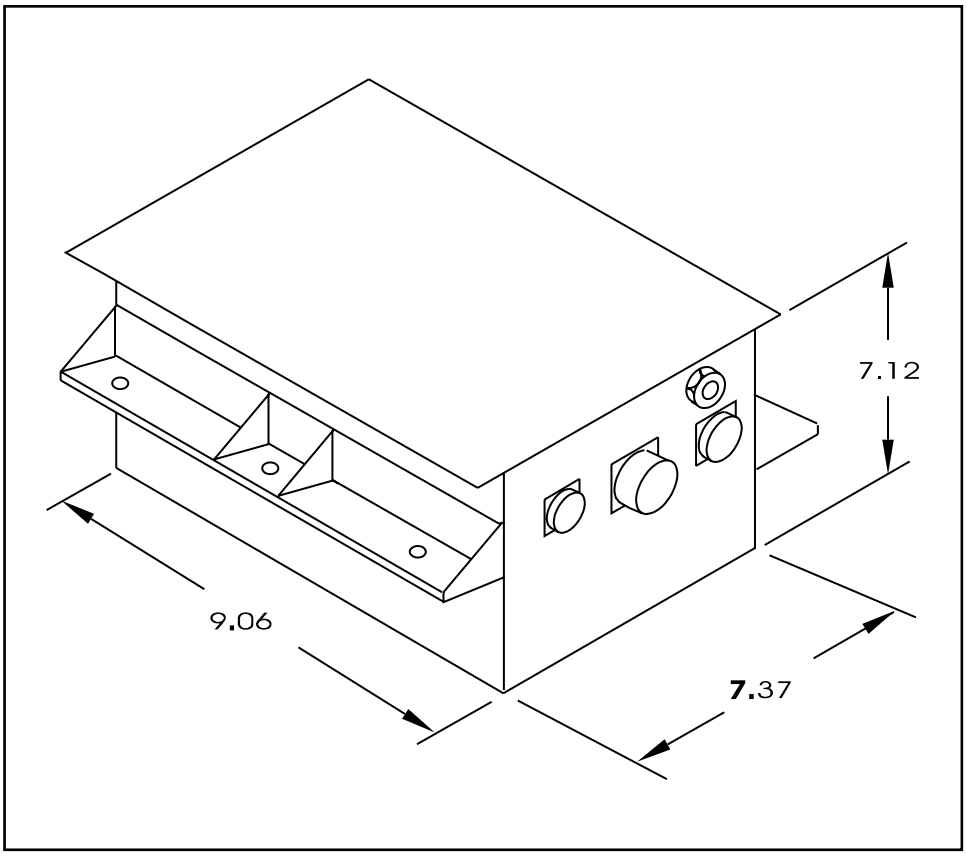
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAP-4557

Voltage	28
Capacity (amp-hrs)	40/25
Rate (amps)	8/120
Weight (lbs)	36
Volume (in^3)	475
Temperature	50-80°F
Heater	28 VDC 40/15 Watts
Wet Stand Time	35 Days



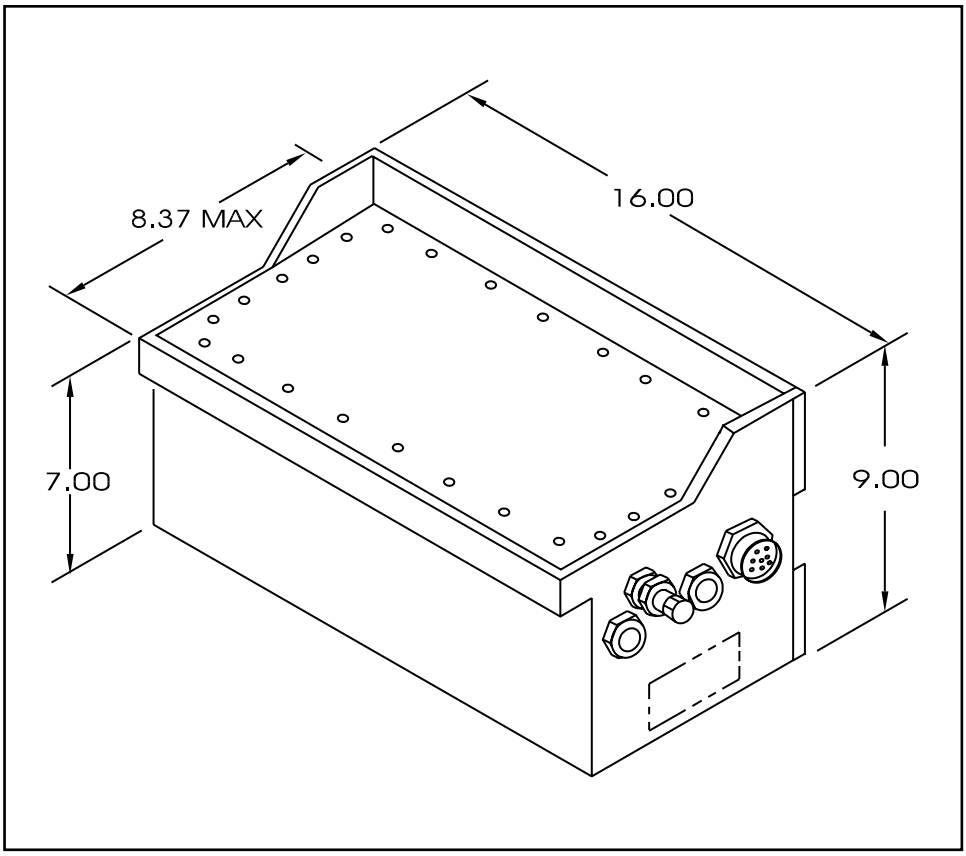
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAP-4565

Voltage	26-32
Capacity (amp-hrs)	85
Rate (amps)	5-50
Weight (lbs)	68
Volume (in^3)	937
Temperature	33-105°F
Wet Stand Time	90 Days



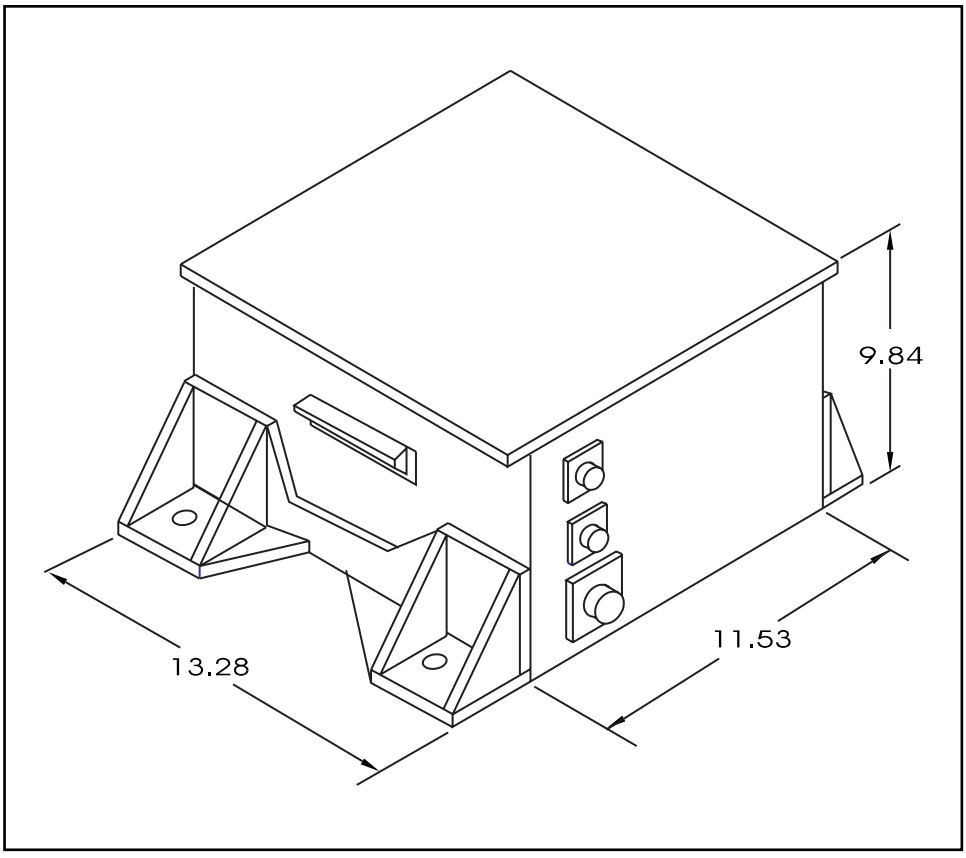
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAP-4570-5

Voltage	28
Capacity (amp-hrs)	250
Rate (amps)	20-90
Weight (lbs)	130
Volume (in^3)	1507
Temperature	0-140°F
Heater	28 VDC 100 Watts
Wet Stand Time	60 Days



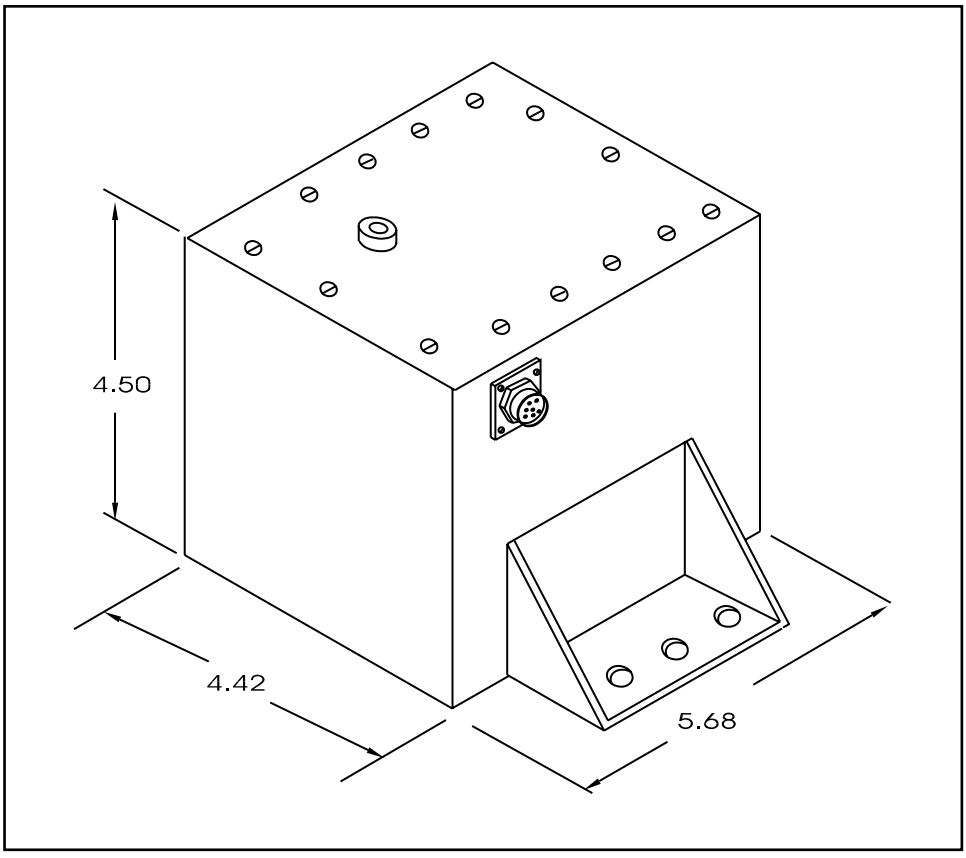
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAP-4573-3

Voltage	28
Capacity (amp-hrs)	4.8 Min.
Rate (amps)	2-28
Weight (lbs)	8.8
Volume (in^3)	113
Temperature	30-80°F
Heater	28 VDC 45 Watts
Wet Stand Time	90 Days



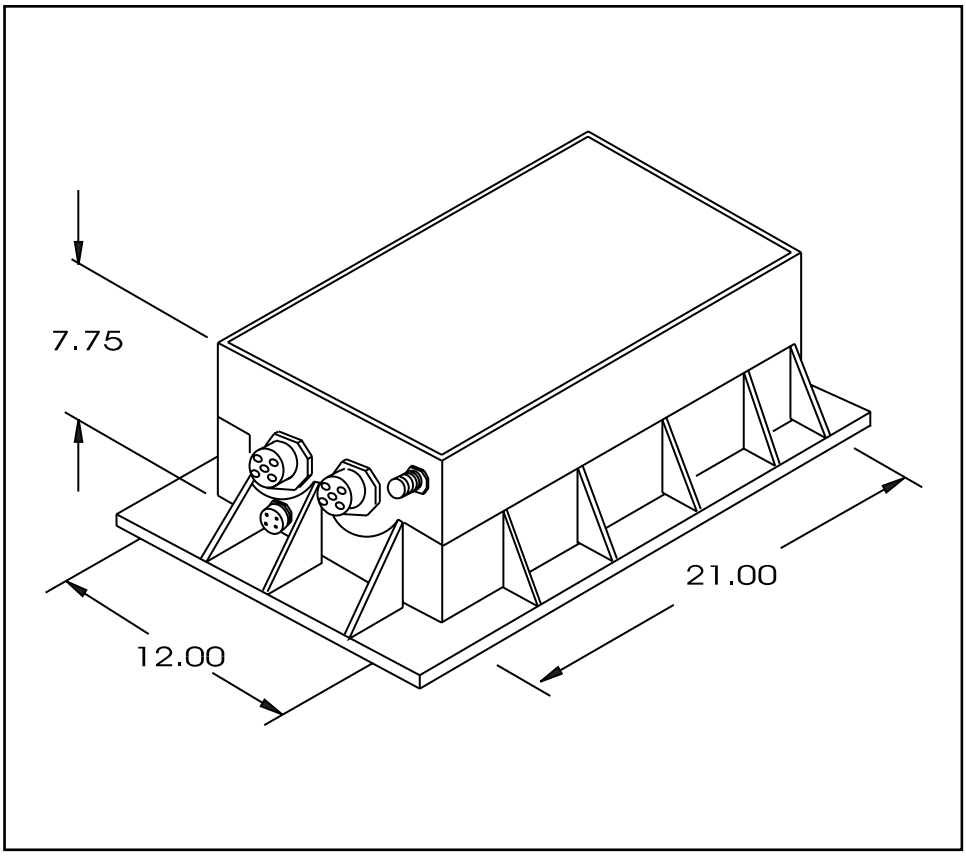
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAP-4592

Voltage	56.0
Capacity (amp-hrs)	70.0
Rate (amps)	64-175
Weight (lbs)	143.5
Volume (in^3)	1953
Temperature	40-95°F
Heater	N/A
Wet Stand Time	7 Months



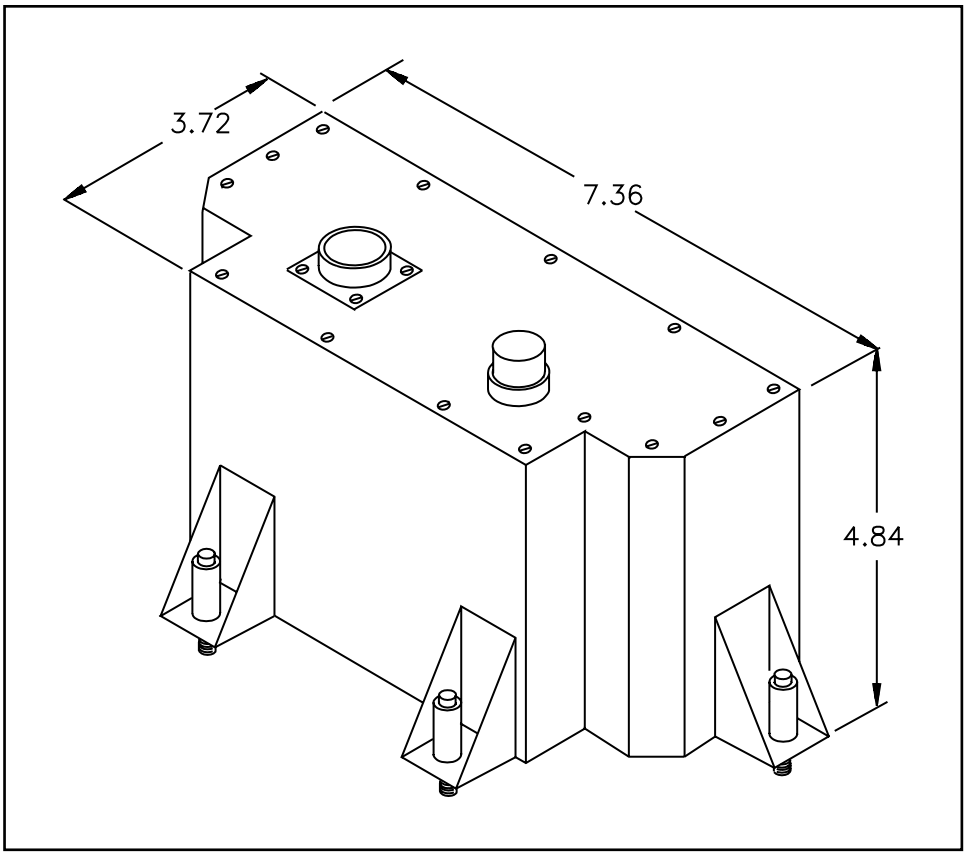
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAR-4494

Voltage	28
Capacity (amp-hrs)	11.7
Rate (amps)	1.0-14.0
Weight (lbs)	11.3
Volume (in^3)	124
Temperature	50-81°F
Wet Stand Time	90 Days



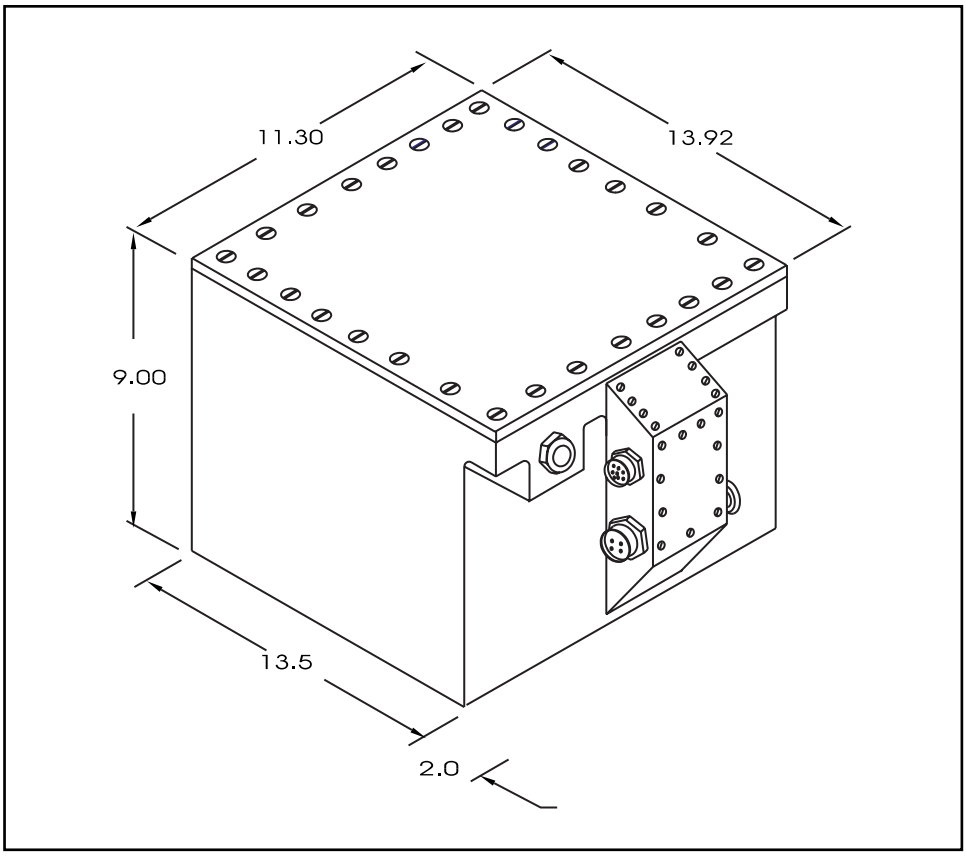
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAR-4504

Voltage	25
Capacity (amp-hrs)	675
Rate (amps)	1.50
Weight (lbs)	160
Volume (in^3)	1378 + connector & housing
Temperature	40-90°F
Heater	None
Max. Heater Time	N/A
Max. Activation	N/A
Max. Stand Time	180 Days



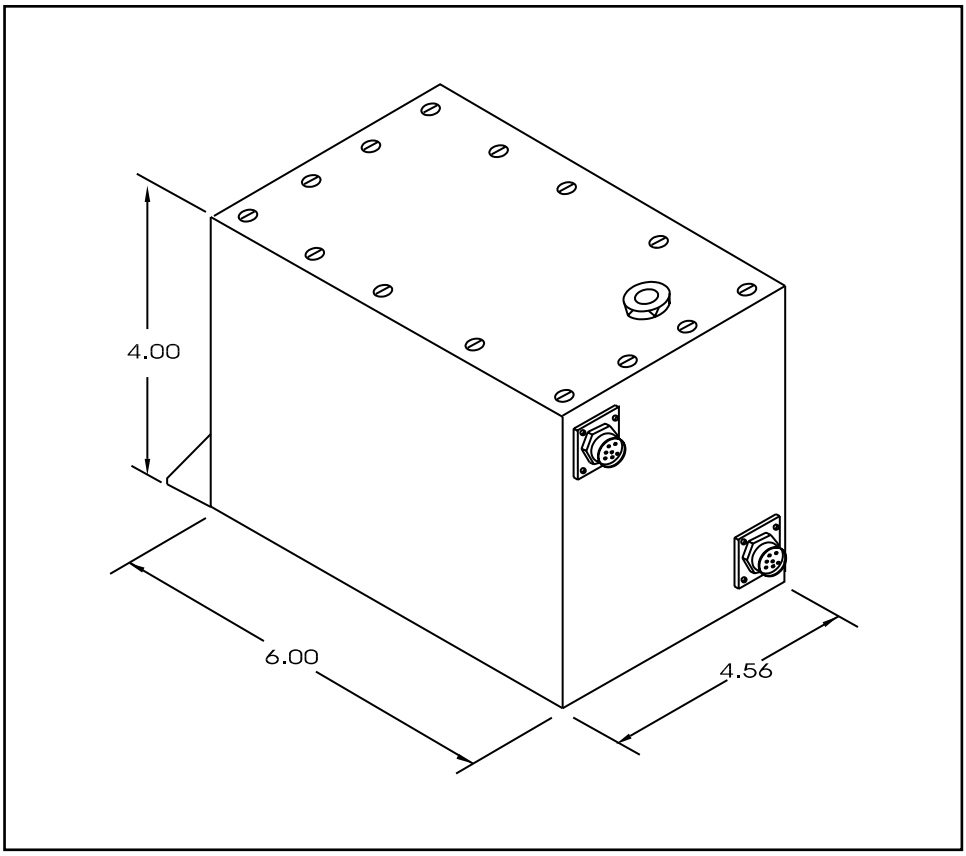
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAR-4545-3

Voltage	28
Capacity (amp-hrs)	3
Rate (amps)	0.5-3.3
Weight (lbs)	6.5
Volume (in^3)	98
Temperature	50-81°F
Heater	28 VDC 33 Watts
Wet Stand Time	150 Days



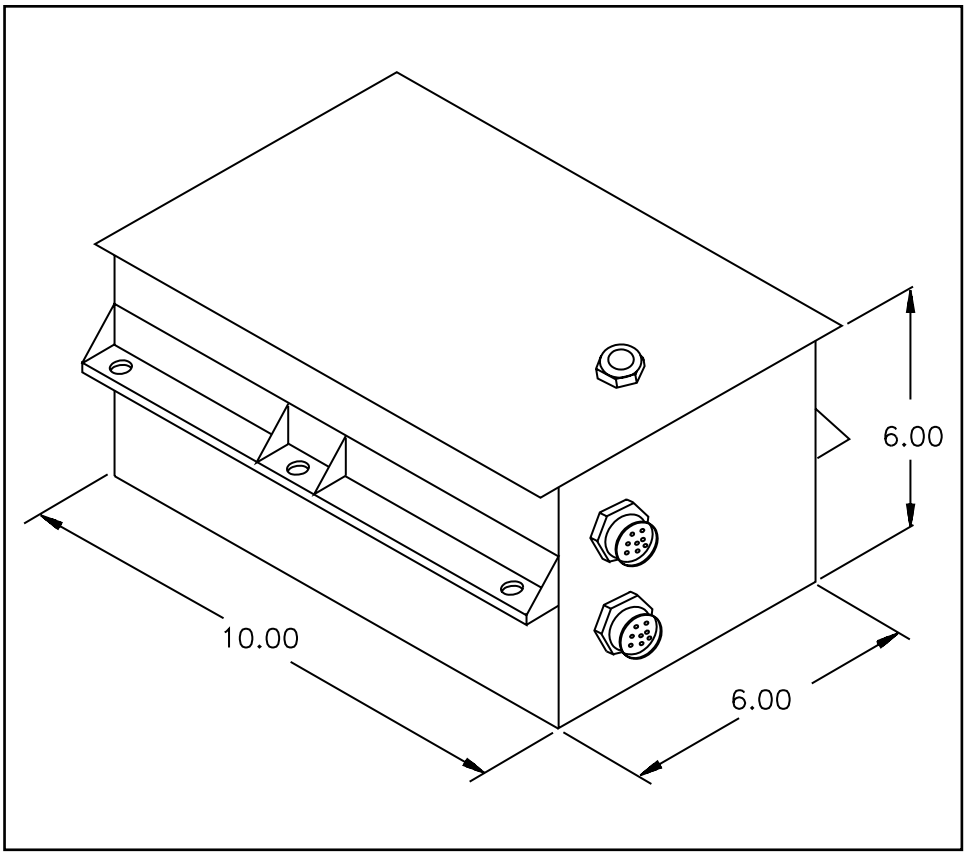
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAR-4546-3

Voltage	28
Capacity (amp-hrs)	20
Rate (amps)	5-27
Weight (lbs)	24
Volume (in^3)	360
Temperature	50-81°F
Heater	28 VDC 70 Watts
Wet Stand Time	150 Days



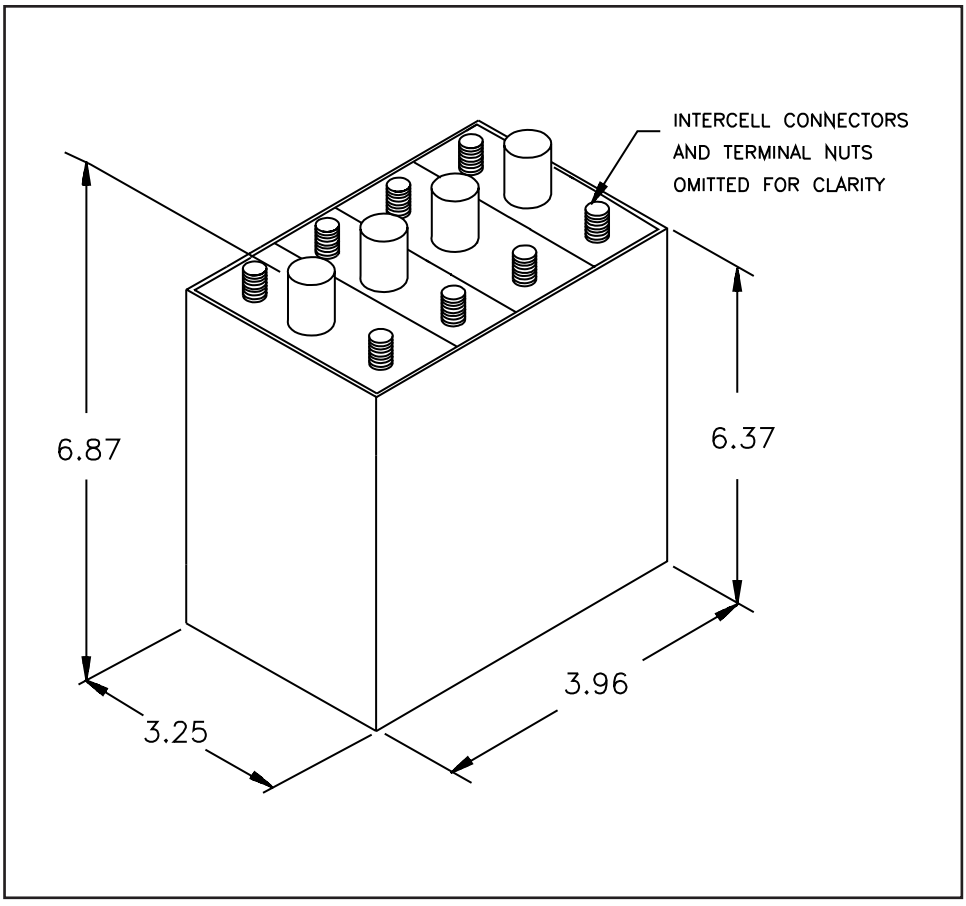
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAR-4554

Voltage	6.0
Capacity (amp-hrs)	40 (60 initial)
Rate (amps)	4 to 15
Weight (lbs)	6.10
Volume (in^3)	88.4
Temperature	60-90°F
Wet Stand Time	12 Months



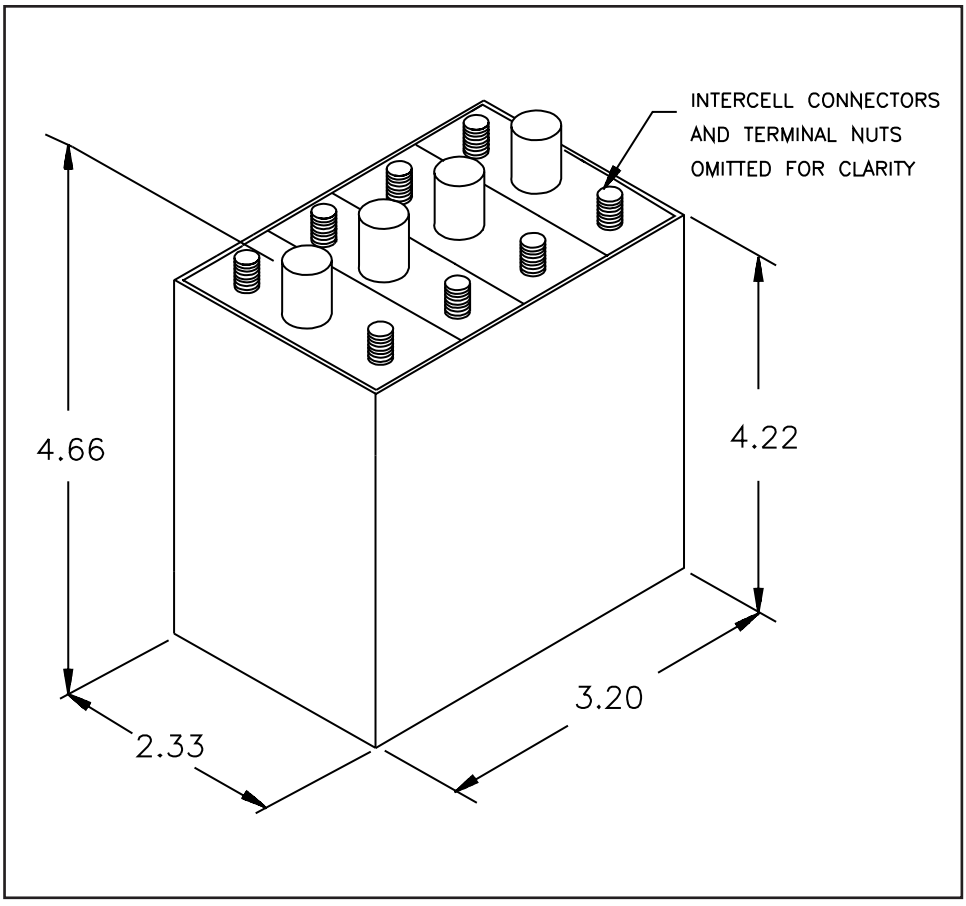
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAR-4572

Voltage	6.0
Capacity (amp-hrs)	15 (25 initial)
Rate (amps)	4
Weight (lbs)	2.70
Volume (in^3)	34.75
Temperature	60-90°F
Wet Stand Time	12 Months



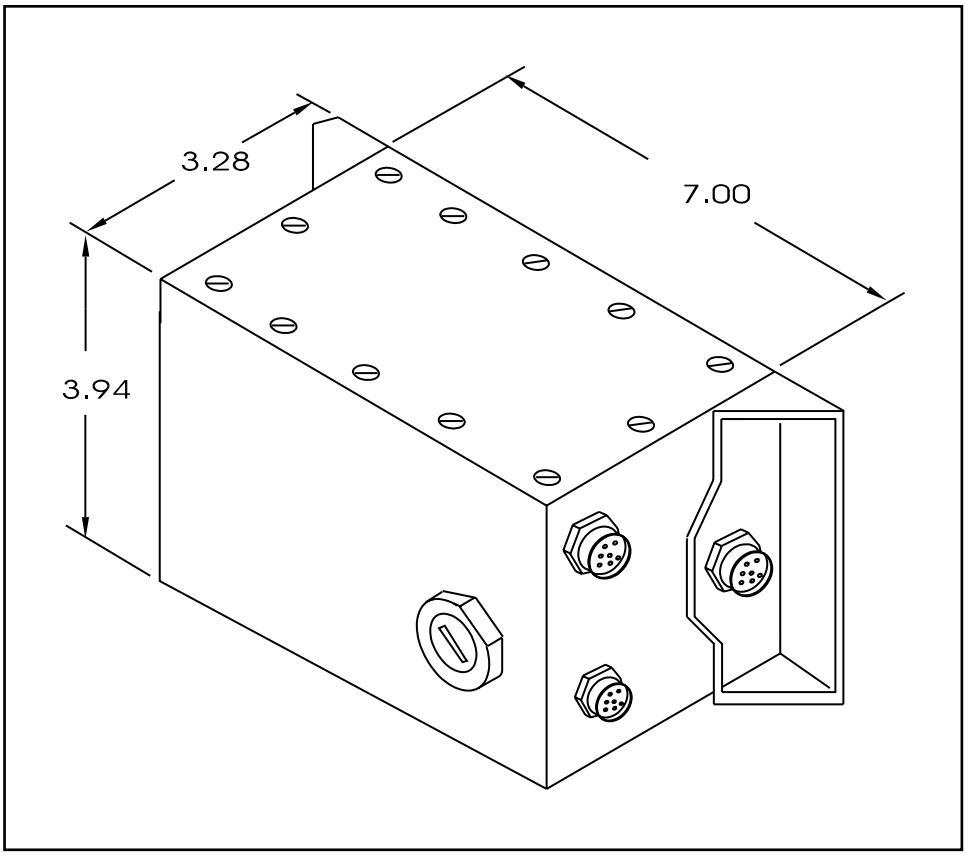
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAR-4574

Voltage	28
Capacity (amp-hrs)	2
Rate (amps)	1.0-9.0
Weight (lbs)	5.75
Volume (in^3)	90.8
Temperature	50-81°F
Heater	28 VDC 10 Watts
Wet Stand Time	150 Days



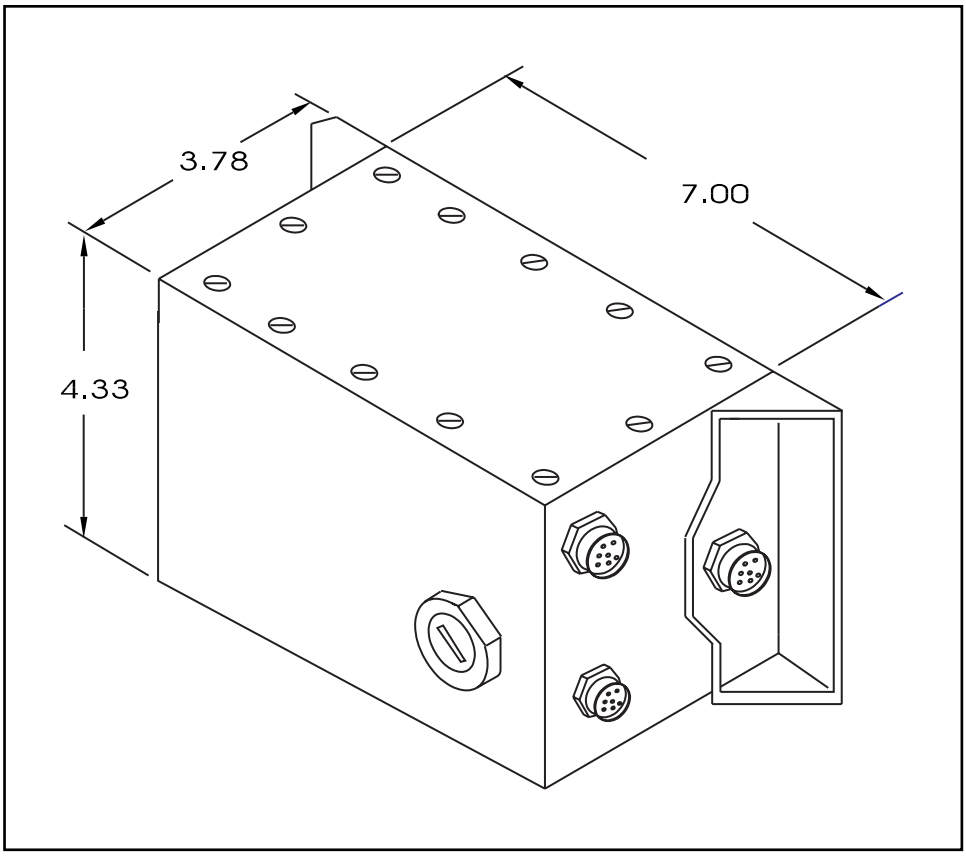
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAR-4575

Voltage	28
Capacity (amp-hrs)	8
Rate (amps)	0.1-1.0
Weight (lbs)	8.1
Volume (in^3)	114.6
Temperature	50-81°F
Heater	28 VDC 10 Watts
Wet Stand Time	150 Days



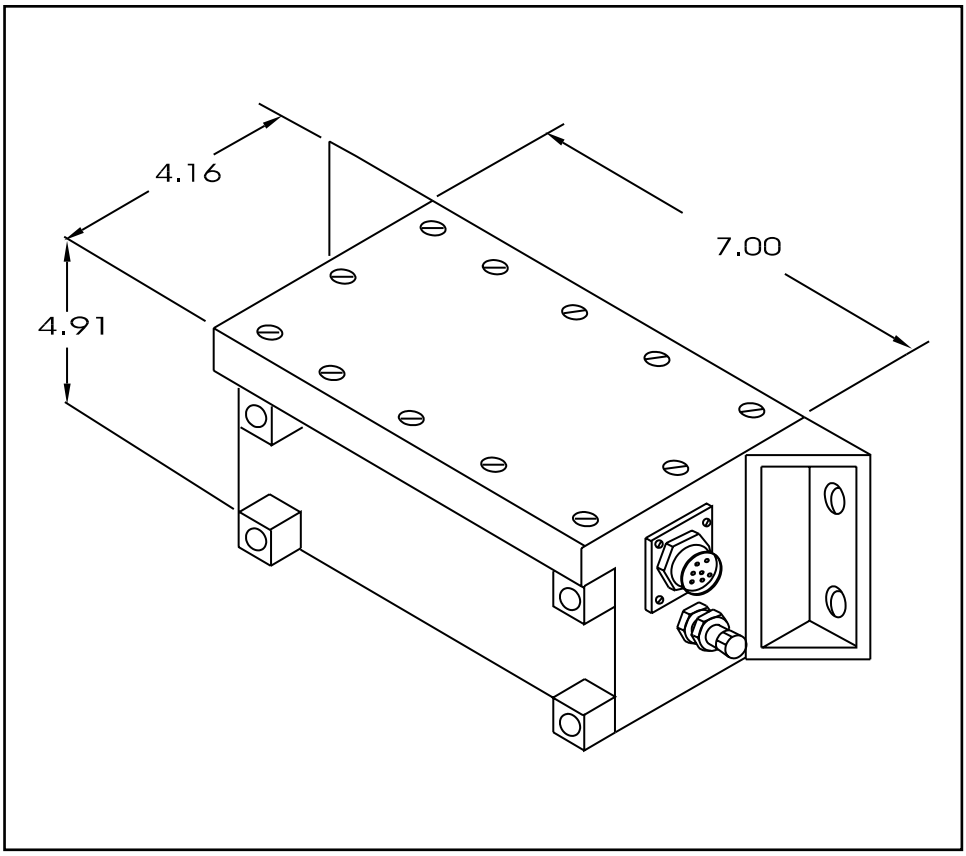
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAR-4577-3

Voltage	28
Capacity (amp-hrs)	11.7
Rate (amps)	1.0-14.0
Weight (lbs)	9.25
Volume (in^3)	130
Temperature	50-81°F
Heater	28 VDC 25 Watts
Wet Stand Time	90 Days



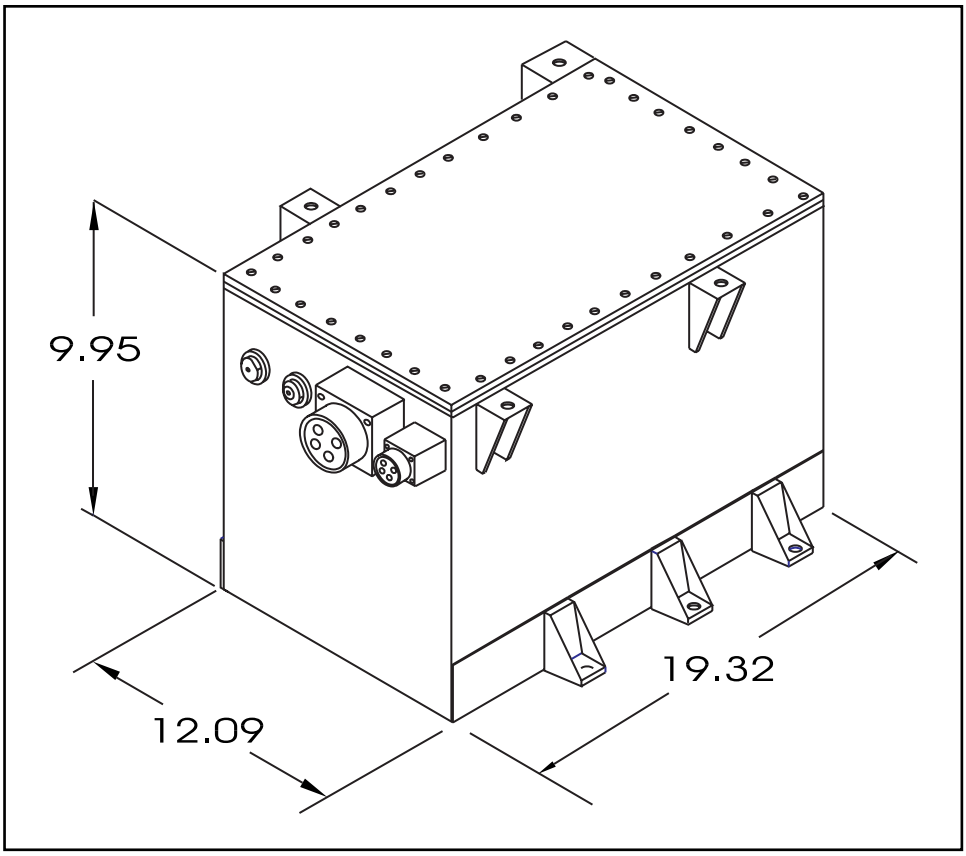
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL MAR-4585

Voltage	28
Capacity (amp-hrs)	555
Rate (amps)	1-120
Weight (lbs)	205
Volume (in^3)	2,324
Temperature	26-85°F
Heater	N/A
Wet Stand Time	270 Days



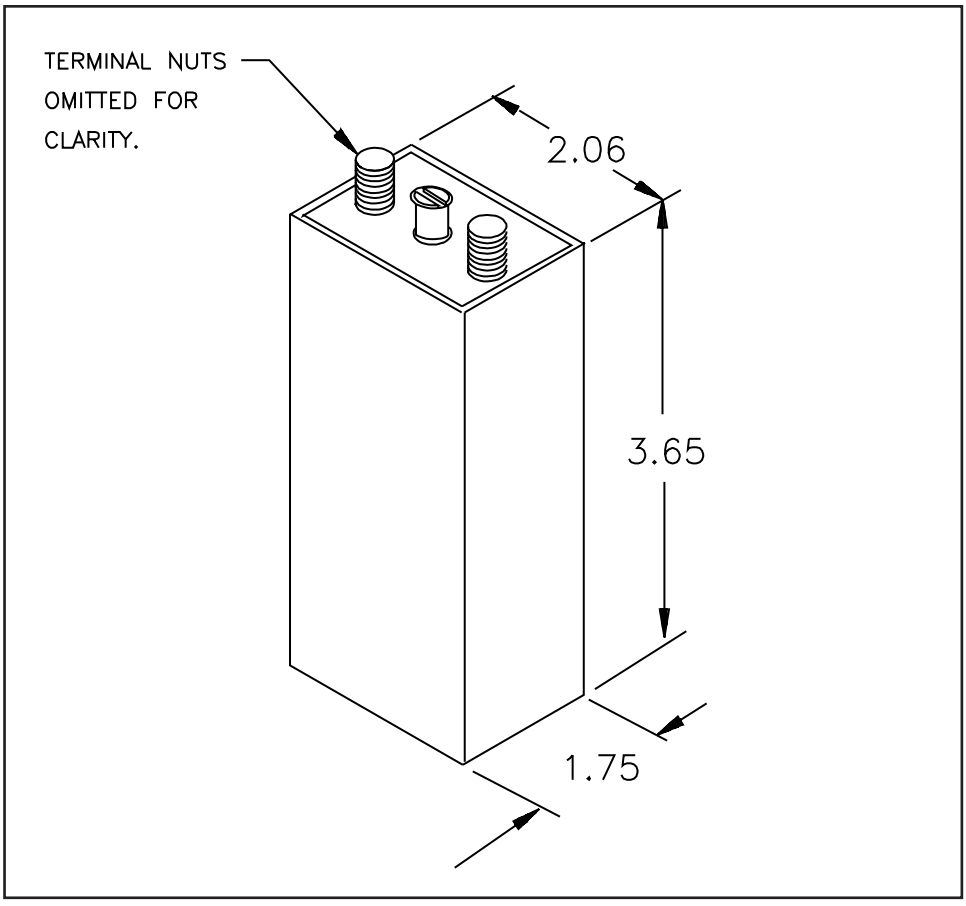
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL SZHR25

Voltage	1.5
Capacity (amp-hrs)	25
Rate (amps)	25
Weight (lbs)	.95
Volume (in^3)	15.4
Temperature	60-80°F
Wet Stand Time	6 Months



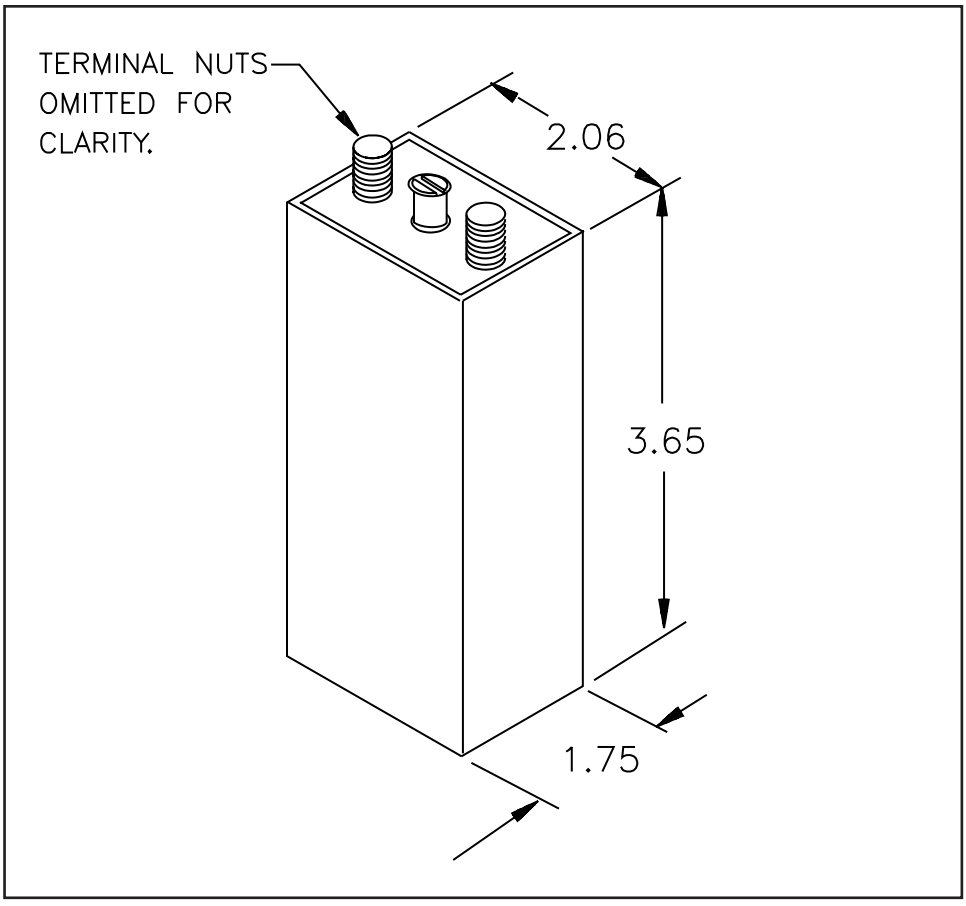
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL SZHR25-5

Voltage	1.5
Capacity (amp-hrs)	40
Rate (amps)	20
Weight (lbs)	1.05
Volume (in^3)	15.4
Temperature	60-80°F
Wet Stand Time	6 Months



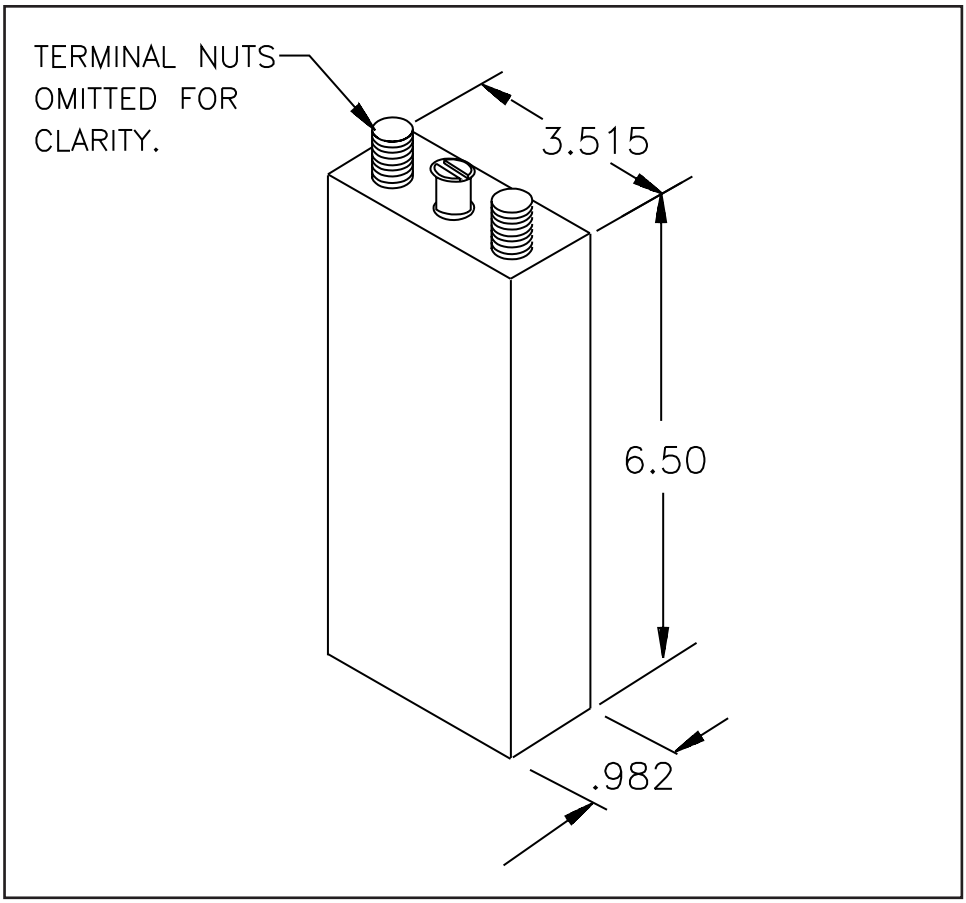
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL SZHR50

Voltage	1.5
Capacity (amp-hrs)	50
Rate (amps)	50
Weight (lbs)	1.67
Volume (in^3)	24.7
Temperature	60-80°F
Wet Stand Time	6 Months



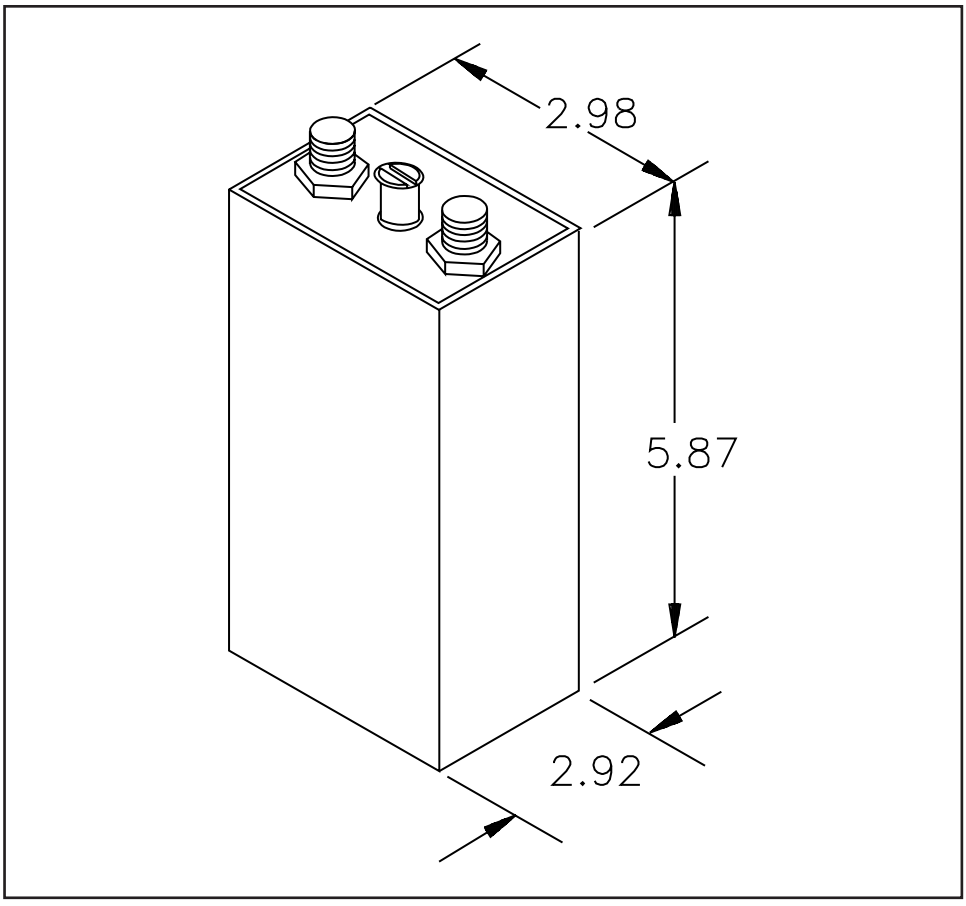
Manually Activated

Silver-Zinc Systems

EAGLE PICHER

MODEL SZLR160

Voltage	1.5
Capacity (amp-hrs)	160 (220 initial)
Rate (amps)	15
Weight (lbs)	4.45
Volume (in^3)	55.4
Temperature	60-90°F
Wet Stand Time	12 Months



Manually Activated

Silver-Zinc Systems