

of TELEPHONE EQUIPMENT & SUPPLIES CATALOG

ISSUED OCTOBER, 1963

POWER EQUIPMENT

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AUTOMATIC ELECTRIC SALES CORPORATION

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Exide Storage Batteries

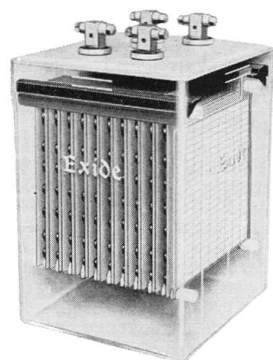
There are two general types of plates used in storage batteries: Planté and Faure. Both types have been proved in telephone work; however, longer life and lower depreciated costs are generally conceded to the Planté type, while the Faure type usually has lower first cost. Planté plates are formed from lead with the active material electro-chemically deposited on ribbons or grooved strips. The Faure (or pasted) plate is usually formed by the mechanical pasting of active material in the open spaces of the grid-shaped, lead antimony sheet.

Exide batteries used in telephone service are the Exide Manchex (Planté Type) and the Exide Tytex (Faure Type).

All Exide batteries listed are of the sealed type which completely confines the spray within the cells. Cell covers are

sealed at top of jar or container and have spray-proof vents. This eliminates need for special compartments, trays, or battery rooms. These batteries are furnished in capacities to meet virtually every requirement. Capacities shown are at 8-hour rate to 1.75 final volts; 1.210 specific gravity at 77°F. These plastic container type batteries are shipped assembled, sealed and charged, complete with electrolyte, inter-cell connectors, and other necessary parts to insure quick and satisfactory installation, and are ready for immediate service. Terminals are equipped with connector bolts. Interunit and intercell connectors are furnished when 2 or more units or cells are ordered. Terminal lugs furnished if required.

Information on battery racks furnished on request.

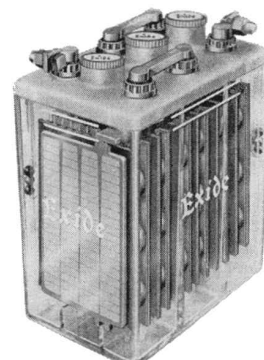


Type FMP-21

Exide Batteries

Exide-Manchex (Planté) Type

This type is the more durable of the two types because of its rugged plate construction. Manchester positive plate consists of a lead-antimony-alloy grid, perforated with openings into which pure lead buttons of active material are forced. Alloy grid resists forming action of current during charge and discharge, and therefore retains its strength, shape and dimensions throughout entire life of plate. Types DMP, EMP and FMP are assembled in heat-resistant and shock-absorbing polystyrene containers with polystyrene covers. Containers and covers are cemented together to form a permanent leak-proof bond against seepage of acid. Types DMP, EMP and FMP cells have burned seal ring construction. Type EMP-5 is assembled in two-cell and three-cell units.



Type 3-CME-5

Type	A.H. Cap. (8-Hr.)	Length Inches	Width Inches	Height Inches	*Weight Pounds	Price Each
DMP-5	40	3 $\frac{1}{8}$	7 $\frac{19}{32}$	13 $\frac{7}{16}$	26	\$21.35
DMP-7	60	4 $\frac{1}{8}$	7 $\frac{19}{32}$	13 $\frac{7}{16}$	34	27.35
DMP-9	80	5 $\frac{1}{8}$	7 $\frac{19}{32}$	13 $\frac{7}{16}$	42	32.65
‡2-EMP-5	80	6 $\frac{7}{8}$	10 $\frac{1}{8}$	17	88	69.75
‡3-EMP-5	80	10 $\frac{1}{4}$	10 $\frac{1}{8}$	17	135	100.75
EMP-7	120	4 $\frac{11}{32}$	10 $\frac{1}{8}$	17	59	42.95
EMP-9	160	5 $\frac{5}{32}$	10 $\frac{1}{8}$	17	73	53.55
EMP-11	200	6 $\frac{7}{8}$	10 $\frac{1}{8}$	17	90	68.05
EMP-13	240	6 $\frac{7}{8}$	10 $\frac{1}{8}$	17	99	79.40
EMP-15	280	8 $\frac{19}{32}$	10 $\frac{1}{8}$	17	117	90.45

Type	A.H. Cap. (8-Hr.)	Length Inches	Width Inches	Height Inches	*Weight Pounds	Price Each
EMP-17	320	10 $\frac{1}{4}$	10 $\frac{1}{8}$	17	136	\$101.80
EMP-19	360	10 $\frac{1}{4}$	10 $\frac{1}{8}$	17	145	111.60
FMP-11	415	7 $\frac{1}{2}$	14 $\frac{17}{32}$	22 $\frac{3}{16}$	182	121.30
FMP-13	498	7 $\frac{1}{2}$	14 $\frac{17}{32}$	22 $\frac{3}{16}$	196	139.70
FMP-15	581	8 $\frac{31}{32}$	14 $\frac{17}{32}$	22 $\frac{3}{16}$	231	163.55
FMP-17	664	10 $\frac{21}{32}$	14 $\frac{17}{32}$	22 $\frac{3}{16}$	266	183.40
FMP-19	747	10 $\frac{21}{32}$	14 $\frac{17}{32}$	22 $\frac{3}{16}$	282	203.40
FMP-21	830	13 $\frac{3}{16}$	14 $\frac{17}{32}$	22 $\frac{3}{16}$	326	219.35
FMP-23	913	13 $\frac{3}{16}$	14 $\frac{17}{32}$	22 $\frac{3}{16}$	343	235.51
FMP-25	996	13 $\frac{3}{16}$	14 $\frac{17}{32}$	22 $\frac{3}{16}$	357	253.15

NOTE: Type EMP-9 cells and larger, have copper inserts to provide an ample electrical path for high current requirements at maximum sustained voltages.

Small Multi-Cell Types

These are assembled in 2 and 3 compartment plastic containers and covers. They have colored pilot balls to show approximate state of charge, funnel-type vents, plastic vent plugs, and double insulation (microporous separators and slotted plastic plate protectors).

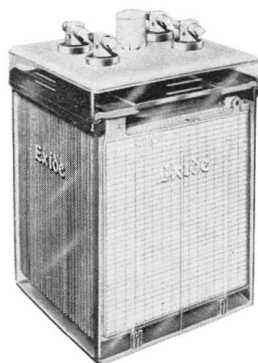
End-to-End Assembly						
Type	A.H. Cap. (8-Hr.)	Length Inches	Width Inches	Height Inches	*Weight Pounds	Price Each
2-CME-3	8	2 $\frac{7}{16}$	8	8 $\frac{1}{2}$	14	\$16.20
2-CME-5	16	2 $\frac{7}{16}$	8	8 $\frac{1}{2}$	17	19.95
2-CME-7	24	3 $\frac{1}{4}$	8	8 $\frac{1}{2}$	24	24.55

Side-to-Side Assembly						
Type	A.H. Cap. (8-Hr.)	Length Inches	Width Inches	Height Inches	*Weight Pounds	Price Each
2-CME-3	8	4 $\frac{15}{32}$	4 $\frac{1}{4}$	8 $\frac{1}{2}$	14	\$16.20
3-CME-3	8	6 $\frac{19}{32}$	4 $\frac{1}{4}$	8 $\frac{1}{2}$	20	23.25
2-CME-5	16	4 $\frac{15}{32}$	4 $\frac{1}{4}$	8 $\frac{1}{2}$	17	19.95
3-CME-5	16	6 $\frac{19}{32}$	4 $\frac{1}{4}$	8 $\frac{1}{2}$	25	28.65
2-CME-7	24	6 $\frac{1}{8}$	4 $\frac{1}{4}$	8 $\frac{1}{2}$	24	24.55
3-CME-7	24	9	4 $\frac{1}{4}$	8 $\frac{1}{2}$	34	35.05

*Packed for less than carload lot. †Two-cell units. ‡Three-cell units.

Exide Batteries

Exide-Tytex (Pasted-Plate) with Silvium



Type FWA-29

This type of battery will furnish greater ampere-hour capacity in a given space than the Exide-Manchex type, and the initial cost is lower. The active material of both positive and negative plates is pasted into the lead-antimony grid or framework of interlocking rib and bar design and locked in place by the horizontal bars.

All Exide-Tytex cells have positive plate grids containing Silvium—our patented alloy that inhibits grid corrosion thus lengthening battery life in telephone service. Where space is limited and initial cost is a consideration, the results obtained from the pasted plate type may justify its selection.

Types DOP, EOP, FOP, EWA and FWA are assembled in heat-resistant, shock-absorbing polystyrene containers with polystyrene covers. All cells have burned seal ring construction. Type EOP-11 cell through Type FOP-31 have copper inserts in the posts to improve conductivity.

Separators are microporous and Vitrex retainers. Ample electrolyte and sediment space are features of Types EOP Exide-Tytex cells. The cover is permanently sealed to the jar to form a leak-proof bond.

Type	A.H. Cap. (8-Hr.)	Length Inches	Width Inches	Height Inches	*Weight Pounds	Price Each	Type	A.H. Cap. (8-Hr.)	Length Inches	Width Inches	Height Inches	*Weight Pounds	Price Each
DOP-5	50	3 $\frac{1}{8}$	7 $\frac{19}{32}$	13 $\frac{7}{16}$	24	\$19.10	FOP-25	938	10 $\frac{21}{32}$	14 $\frac{17}{32}$	22 $\frac{5}{16}$	249	\$171.50
DOP-7	75	4 $\frac{1}{8}$	7 $\frac{19}{32}$	13 $\frac{7}{16}$	30	22.55	FOP-27	1017	13 $\frac{3}{16}$	14 $\frac{17}{32}$	22 $\frac{5}{16}$	283	183.45
DOP-9	100	5 $\frac{1}{8}$	7 $\frac{19}{32}$	13 $\frac{7}{16}$	37	26.05	FOP-29	1095	13 $\frac{3}{16}$	14 $\frac{17}{32}$	22 $\frac{5}{16}$	294	194.50
†2-EOP-7	120	6 $\frac{7}{8}$	10 $\frac{1}{8}$	17	85	55.60	FOP-31	1173	13 $\frac{3}{16}$	14 $\frac{17}{32}$	22 $\frac{5}{16}$	304	203.40
†3-EOP-7	120	10 $\frac{1}{4}$	10 $\frac{1}{8}$	17	130	83.40	†2-EWA-7	180	6 $\frac{7}{8}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	102	76.00
EOP-9	160	4 $\frac{11}{32}$	10 $\frac{1}{8}$	17	53	31.90	†3-EWA-7	180	10 $\frac{1}{4}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	149	101.65
EOP-11	200	5 $\frac{5}{32}$	10 $\frac{1}{8}$	17	65	34.65	EWA-9	240	4 $\frac{11}{32}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	64	41.70
EOP-13	240	6 $\frac{7}{8}$	10 $\frac{1}{8}$	17	79	52.90	EWA-11	300	5 $\frac{5}{32}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	77	51.00
EOP-15	280	6 $\frac{7}{8}$	10 $\frac{1}{8}$	17	85	59.85	EWA-13	360	6 $\frac{7}{8}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	100	61.80
EOP-17	320	6 $\frac{7}{8}$	10 $\frac{1}{8}$	17	90	67.85	EWA-15	420	6 $\frac{7}{8}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	105	69.20
EOP-19	360	8 $\frac{19}{32}$	10 $\frac{1}{8}$	17	104	75.80	EWA-17	480	8 $\frac{19}{32}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	123	75.70
EOP-21	400	8 $\frac{19}{32}$	10 $\frac{1}{8}$	17	110	83.80	EWA-19	540	8 $\frac{19}{32}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	128	83.10
FOP-13	469	7 $\frac{1}{2}$	14 $\frac{17}{32}$	22 $\frac{5}{16}$	156	93.30	EWA-21	600	10 $\frac{1}{4}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	147	91.05
FOP-15	547	7 $\frac{1}{2}$	14 $\frac{17}{32}$	22 $\frac{5}{16}$	164	108.05	EWA-23	660	10 $\frac{1}{4}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	152	98.90
FOP-17	626	7 $\frac{1}{2}$	14 $\frac{17}{32}$	22 $\frac{5}{16}$	173	123.65	FWA-15	840	7 $\frac{1}{2}$	14 $\frac{17}{32}$	23	187	131.00
FOP-19	704	8 $\frac{31}{32}$	14 $\frac{17}{32}$	22 $\frac{5}{16}$	203	135.55	FWA-19	1080	8 $\frac{31}{32}$	14 $\frac{17}{32}$	23	233	154.50
FOP-21	782	8 $\frac{31}{32}$	14 $\frac{17}{32}$	22 $\frac{5}{16}$	211	147.35	FWA-23	1320	10 $\frac{21}{32}$	14 $\frac{17}{32}$	23	276	176.15
FOP-23	860	10 $\frac{21}{32}$	14 $\frac{17}{32}$	22 $\frac{5}{16}$	240	159.40	FWA-29	1680	13 $\frac{3}{16}$	14 $\frac{17}{32}$	23	333	197.75

Small Multi-Cell Types

These types are assembled in 2 and 3 cell units in plastic containers with plastic covers. The cover is permanently sealed to the container to positively eliminate seepage of acid. Double insulation consists of microporous separators and Vitrex retainers. Units have funnel-type vents, plastic vent plugs and two sets of pilot balls to indicate the approximate state of charge.

End-to-End Assembly							Side-to-Side Assembly						
Type	A.H. Cap. (8-Hr.)	Length Inches	Width Inches	Height Inches	*Weight Pounds	Price Each	Type	A.H. Cap. (8-Hr.)	Length Inches	Width Inches	Height Inches	*Weight Pounds	Price Each
2-COE-3	10	2 $\frac{7}{16}$	8	8 $\frac{1}{2}$	13	\$10.85	2-COE-3	10	4 $\frac{13}{32}$	4 $\frac{1}{4}$	8 $\frac{1}{2}$	13	\$10.70
2-CWA-5	15	2 $\frac{3}{32}$	7 $\frac{3}{4}$	7 $\frac{5}{16}$	11	13.00	3-COE-3	10	6 $\frac{19}{32}$	4 $\frac{1}{4}$	8 $\frac{1}{2}$	18	15.90
2-COE-5	20	2 $\frac{7}{16}$	8	8 $\frac{1}{2}$	15	18.50	2-COE-5	20	4 $\frac{13}{32}$	4 $\frac{1}{4}$	8 $\frac{1}{2}$	15	18.50
2-COE-7	30	3 $\frac{1}{4}$	8	8 $\frac{1}{2}$	21	20.20	3-COE-5	20	6 $\frac{19}{32}$	4 $\frac{1}{4}$	8 $\frac{1}{2}$	22	24.55
							2-COE-7	30	6 $\frac{1}{8}$	4 $\frac{1}{4}$	8 $\frac{1}{2}$	21	20.15
							3-COE-7	30	9	4 $\frac{1}{4}$	8 $\frac{1}{2}$	30	26.65

*Packed for less than carload lot. †Two-cell units. ‡Three-cell units.

Prices are subject to change without notice.

Q-3

Exide Batteries

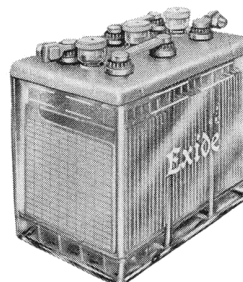
Exide-Tytex (Pasted-Plate) with Silvium (Cont'd.)

Larger Multi-Cell Types

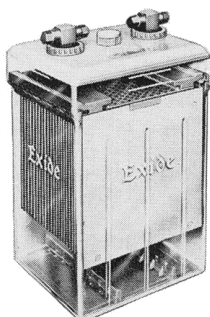
These types are assembled in 2 and 3 cell units in plastic containers with plastic covers. The cover is permanently sealed to the container to form an acid-tight bond. Each unit is equipped with two sets of pilot balls to indicate approximate state of charge. Insulation consists of microporous and Vitrex retainers.

An outstanding feature of these batteries is the built-in explosion control device.

Batteries come equipped with plastic vent caps and filling funnels.



							Type 3-PLX13						
§Type	A.H. Cap. (8-Hr.)	Length Inches	Width Inches	Height Inches	*Weight Pounds	Price Each	§Type	A.H. Cap. (8-Hr.)	Length Inches	Width Inches	Height Inches	*Weight Pounds	Price Each
2-PLX-7	50	4 ¹⁵ / ₃₂	7 ⁵ / ₁₆	10 ³ / ₁₆	32	\$22.85	2-PLX-13	100	7 ³ / ₄	7 ⁵ / ₁₆	10 ³ / ₁₆	54	\$29.70
3-PLX-7	50	6 ¹ / ₁₆	7 ⁵ / ₁₆	10 ³ / ₁₆	44	\$2.50	3-PLX-13	100	11 ³ / ₈	7 ⁵ / ₁₆	10 ³ / ₁₆	76	\$43.85



Exide Calcium Alloy Cells

Exide calcium alloy batteries are assembled in heat-resistant, shock-absorbing polystyrene containers with permanently sealed plastic covers. Types EW and FW were developed mainly for telephone service. Carefully controlled automatic full-float charging must be used.

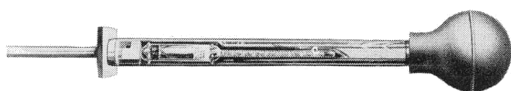
Types EW and FW are equipped with Exide explosion control feature. As a companion line we offer the Exide-Tytex with calcium alloy in Types DCP and ECP.

Type ECP-21													
Type	A.H. Cap. (8-Hr.)	Length Inches	Width Inches	Height Inches	*Weight Pounds	Price Each	Type	A.H. Cap. (8-Hr.)	Length Inches	Width Inches	Height Inches	*Weight Pounds	Price Each
‡2-EW-7	180	6 $\frac{7}{8}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	102	\$90.25	FW-29	1680	13 $\frac{3}{16}$	14 $\frac{17}{32}$	23	333	\$207.90
‡3-EW-7	180	10 $\frac{1}{4}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	149	\$129.80	DCP-5	50	3 $\frac{1}{8}$	7 $\frac{19}{32}$	13 $\frac{7}{16}$	26	\$21.80
EW-9	240	4 $\frac{11}{32}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	64	\$4.65	DCP-7	75	4 $\frac{1}{8}$	7 $\frac{19}{32}$	13 $\frac{7}{16}$	33	\$25.30
EW-11	300	5 $\frac{9}{32}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	77	\$3.30	DCP-9	100	5 $\frac{1}{8}$	7 $\frac{19}{32}$	13 $\frac{7}{16}$	41	\$29.90
EW-13	360	6 $\frac{7}{8}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	100	\$4.20	‡2-ECP-7	120	6 $\frac{7}{8}$	10 $\frac{1}{8}$	17	93	\$61.15
EW-15	420	6 $\frac{7}{8}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	105	\$0.95	‡3-ECP-7	120	10 $\frac{1}{4}$	10 $\frac{1}{8}$	17	141	\$91.75
EW-17	480	8 $\frac{19}{32}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	123	\$1.60	ECP-9	160	4 $\frac{11}{32}$	10 $\frac{1}{8}$	17	57	\$35.10
EW-19	540	8 $\frac{19}{32}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	128	\$7.05	ECP-11	200	5 $\frac{5}{8}$	10 $\frac{1}{8}$	17	71	\$8.10
EW-21	600	10 $\frac{1}{4}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	147	\$05.70	ECP-13	240	6 $\frac{7}{8}$	10 $\frac{1}{8}$	17	91	\$8.25
EW-23	660	10 $\frac{1}{4}$	10 $\frac{1}{8}$	18 $\frac{1}{4}$	152	\$13.75	ECP-15	280	6 $\frac{7}{8}$	10 $\frac{1}{8}$	17	96	\$6.10
FW-15	840	7 $\frac{1}{2}$	14 $\frac{17}{32}$	23	187	\$39.05	ECP-17	320	6 $\frac{7}{8}$	10 $\frac{1}{8}$	17	101	\$4.65
FW-19	1080	8 $\frac{31}{32}$	14 $\frac{17}{32}$	23	233	\$63.15	ECP-19	360	8 $\frac{19}{32}$	10 $\frac{1}{8}$	17	120	\$3.35
FW-23	1320	10 $\frac{21}{32}$	14 $\frac{17}{32}$	23	276	\$85.90	ECP-21	400	8 $\frac{19}{32}$	10 $\frac{1}{8}$	17	125	\$2.25

NOTE: Types ECP-11 through ECP-21 have copper inserts to provide an ample electrical path for high current requirements at maximum sustained voltages.

*Packed for less than carload lot. †Two-cell units. ‡Three-cell units. §Available as PWA without pilot ball indicators.

Portable Hydrometer Syringes



S-1-B Hydrometer Syringes

Cat. No.	Type	Description	Wt. Oz.	Price Each
S-4881	44877	For Unit Types CME, COE and PLX	12	\$2.10

V-2-S Hydrometer Syringes

Cat. No.	Type	Description	Wt. Oz.	Price Each
S-4880	10217	For Cell Types DMP, EMP, DOP, EOP, ECP, all KXHS, DME, DOE, EME, EOE, FME, FOE, EW and FB	12	\$2.25

Hydrometer Floats Only

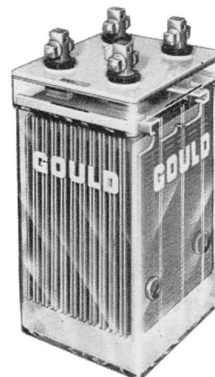
Cat. No.	Type	For Use with Hydrometer	Wt. Oz.	Price Each
S-4236	10246	S-4880	2	\$7.75
S-4237	24295	S-4881	2	.75

Vent Plug Hydrometer Syringes and Vent Plug Thermometers are available on order.

Prices are subject to change without notice.

Gould Kathanode Plastic Jar Batteries
Antimony Types—DKR, EKR and FKR
Capacities—50 to 1140 Ampere Hours

DKR-9

EKR-15

FKR-23

Single Cells: sealed plastic jars and plastic covers; suspended elements.

Separation: Durapor porous rubber separators, fibrous glass mats and folded perforated plastic retainers.

Posts: Types DKR-5 to EKR-13 have two posts per cell; Types EKR-15 to FKR-31 have four posts per cell.

Specific Gravity of Electrolyte: fully charged 1.215 at 77°F. (25°C.).

 Electrolyte: height above plate tops; Type DKR, 1 $\frac{5}{8}$ inches; Type EKR, 1 $\frac{1}{2}$ inches; Type FKR, 2 $\frac{1}{4}$ inches.

 Sediment Space: Type DKR, 1 $\frac{1}{2}$ inches; Type EKR, 1 $\frac{9}{16}$ inches; Type FKR, 2 $\frac{3}{16}$ inches.

Intercell Connectors: lead plated copper strip; all cells shipped complete assembled, sealed and charged, with necessary accessories.

Type of Cell	Ampere Hour Capacity 8 Hr. Rate of Discharge	CAPACITY AT 77°F.								OVERALL DIMENSIONS			Electrolyte Gallons per Cell	APPROXIMATE		Price Each
		Amperes For 8 Hours 1.75 F.V.	AMPERES FOR —4 HOURS—		AMPERES FOR —8 HOURS—		AMPERES FOR —12 HOURS—		Net					Pallet-ized		
			To 1.77 F.V.	To 1.96 F.V.	To 1.77 F.V.	To 1.96 F.V.	To 1.77 F.V.	To 1.96 F.V.		Length	Width	Height				
DKR-5	50	6.25	10	5	6	3	5	3	27 ¹ / ₁₆	7 ³ / ₈	12 ⁵ / ₈	0.34	17	20	\$19.10	
DKR-7	75	9.37	15	8	9	5	7	4	41 ¹ / ₁₆	7 ³ / ₈	12 ⁵ / ₈	0.64	25	28	22.55	
DKR-9	100	12.50	20	10	12	7	9	5	41 ¹ / ₁₆	7 ³ / ₈	12 ⁵ / ₈	0.59	28	31	26.05	
DKR-11	125	15.62	25	13	15	8	11	6	5 ³ / ₈	7 ³ / ₈	12 ⁵ / ₈	0.90	34	39	27.80	
DKR-13	150	18.75	30	16	18	10	14	8	5 ³ / ₈	7 ³ / ₈	12 ⁵ / ₈	0.86	37	42	30.40	
DKR-15	175	21.87	35	18	22	12	16	9	6 ¹ / ₄	7 ¹ / ₂	13 ¹ / ₈	1.00	45	50	32.20	
DKR-17	200	25.00	40	21	25	14	18	10	7 ⁷ / ₁₆	7 ¹ / ₂	13 ¹ / ₈	1.19	51	57	33.85	
EKR-11	200	25.0	40.6	19.2	24.6	12.7	18.2	9.7	6 ³ / ₁₆	9 ⁹ / ₁₆	15 ¹ / ₂	1.7	66	72	34.30	
EKR-13	240	30.0	48.7	24.8	29.5	15.3	21.8	11.6	6 ³ / ₁₆	9 ⁹ / ₁₆	15 ¹ / ₂	1.6	71	77	52.90	
EKR-15	280	35.0	56.8	26.9	34.4	17.8	25.4	13.5	6 ³ / ₁₆	9 ⁹ / ₁₆	15 ¹ / ₂	1.5	81	88	59.85	
EKR-17	320	40.0	65.0	30.8	39.4	20.4	29.1	15.5	7 ¹ / ₁₆	9 ⁹ / ₁₆	15 ¹ / ₂	1.8	91	98	67.85	
EKR-19	360	45.0	73.0	34.6	44.2	22.9	32.7	17.4	8 ¹³ / ₁₆	9 ⁹ / ₁₆	15 ¹ / ₂	2.3	105	113	75.80	
EKR-21	400	50.0	81.2	38.5	49.2	25.5	36.4	19.3	8 ¹³ / ₁₆	9 ⁹ / ₁₆	15 ¹ / ₂	2.2	110	119	83.80	
EKR-23	440	55.0	89.3	42.3	54.0	28.0	40.0	21.2	10 ¹ / ₈	9 ⁹ / ₁₆	15 ¹ / ₂	2.7	122	131	91.00	
EKR-25	480	60.0	97.4	46.2	59.0	30.6	43.6	23.2	10 ¹ / ₈	9 ⁹ / ₁₆	15 ¹ / ₂	2.6	128	137	97.65	
EKR-27	520	65.0	105.5	50.0	64.0	33.1	47.3	25.2	11 ⁵ / ₈	9 ⁹ / ₁₆	15 ¹ / ₂	3.1	138	148	105.57	
EKR-29	560	70.0	112.	58.	69.	38.	51.	29.	11 ⁵ / ₈	9 ⁹ / ₁₆	15 ¹ / ₂	3.0	147	157	113.40	
FKR-17	608	76.0	123.2	58.5	75.5	38.8	55.2	29.4	8 ¹ / ₁₆	13	19 ⁷ / ₈	3.6	166	178	123.65	
FKR-19	684	85.5	138.8	65.7	84.0	43.5	62.1	33.1	8 ¹ / ₁₆	13	19 ⁷ / ₈	3.4	177	189	135.55	
FKR-21	760	95.0	154.2	73.2	93.5	48.4	69.0	36.8	9 ¹³ / ₁₆	13	19 ⁷ / ₈	4.9	200	212	147.10	
FKR-23	836	104.5	169.6	80.5	102.8	53.3	76.0	40.5	9 ¹³ / ₁₆	13	19 ⁷ / ₈	4.8	213	225	159.40	
FKR-25	912	114.0	185.2	87.7	112.0	58.1	82.9	44.1	12 ¹ / ₂	13	19 ⁷ / ₈	6.7	238	253	171.25	
FKR-27	988	123.5	200.4	95.0	121.4	62.9	89.9	47.8	12 ¹ / ₂	13	19 ⁷ / ₈	6.5	252	267	183.10	
FKR-29	1064	133.0	216.0	102.5	130.8	67.9	97.0	51.5	12 ¹ / ₂	13	19 ⁷ / ₈	6.3	264	279	194.50	
FKR-31	1140	142.5	232.0	109.8	140.2	72.8	103.7	54.4	12 ¹ / ₂	13	19 ⁷ / ₈	6.1	276	292	203.40	

Prices are subject to change without notice.

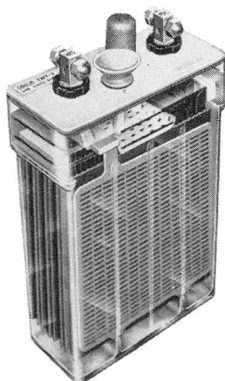
Q-5

Gould Kathanode Plastic Jar Batteries

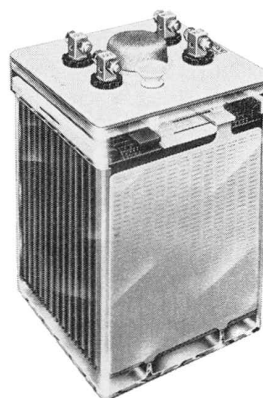
Lead Antimony Types—EWT and FWT

Calcium Types—ET and FT

Capacities—120 to 1680 Ampere Hours



ET-9 and EWT-9



FT-29 and FWT-29

Transparent Plastrite plastic jars.
Plastic covers.
Porous vents.
Thickness of Durapor rubber separators, $\frac{5}{32}$ -inch.
Glass mats and perforated plastic retainers.
Bolted type terminal posts.
Specific Gravity of Electrolyte: fully charged—1.215 at 77°F.

Electrolyte above plates: Types ET and EWT, $2\frac{3}{4}$ inches;
Type FT and FWT, $2\frac{5}{8}$ inches.
Sediment space, $1\frac{1}{2}$ inches.
High and low level lines on jar.
Positive plates are suspended from sidewalls of jar.
Negative plates are supported on ribs in bottom of jar.
Lead plated copper strip intercell connectors.

TYPE OF CELL		Cells per Unit	Ampere Hour Capacity at 8-Hr. Discharge	*CAPACITY AT 77°F. (25°C.)						OVERALL DIMENSIONS INCHES			Elec- trolyte Fin- ish per Cell	Rate Amp.	APPROX. WT., LBS. PER UNIT		PRICE EACH	
Calcium	Antimony			For 8 Hrs.	For 3 Hrs.	For 1½ Hrs.	For 1 Hr.	For 1 Min.	For 1 Min.	Lgth.	Width	Ht.			Net	ized Calcium Antimony	Calcium	Antimony
ET-54	EWT-54	2	120	15.0	30.0	43.8	60	174	314	7	10½	18	1.2	6	89	92	\$69.95	\$59.40
ET-56	EWT-56	3	120	15.0	30.0	43.8	60	174	314	10½	10½	18	1.2	6	124	128	100.90	79.70
ET-74	EWT-74	2	180	22.5	44.0	65.7	81	195	390	7	10½	18	1.0	9	107	110	90.25	76.00
ET-76	EWT-76	3	180	22.5	44.0	65.7	81	195	390	10½	10½	18	1.0	9	151	155	129.80	101.65
ET- 9	EWT- 9	1	240	30.0	58.7	87.6	108	260	520	5½	10½	18	1.6	12	77	80	54.65	41.70
ET-11	EWT-11	1	300	37.5	73.4	109.5	135	315	625	6	10½	18	2.0	15	83	88	63.30	51.00
ET-13	EWT-13	1	360	45	88	131.4	162	367	735	7¾	10½	18	2.5	18	99	108	74.20	61.80
ET-15	EWT-15	1	420	52.5	102.6	153.3	189	420	840	7¾	10½	18	2.8	21	106	115	80.95	69.20
ET-17	EWT-17	1	480	60	116.7	175.2	216	464	940	9½	10½	18	3.2	24	128	136	91.60	75.70
ET-19	EWT-19	1	540	67.5	132.0	197.1	243	513	1035	9½	10½	18	3.5	27	135	143	97.05	83.10
ET-21	EWT-21	1	600	75	146.7	219	270	560	1100	11¼	10½	18	3.8	30	156	160	105.70	91.05
ET-23	EWT-23	1	660	82.5	161.3	240.9	297	605	1155	11¼	10½	18	4.2	33	163	167	113.75	98.90
FT-13	FWT-13	...	720	90	176	262.1	324	675	1275	7¾	14½	22½	4.0	36	185	191	132.55	118.90
FT-15	FWT-15	...	840	105	206	306	378	770	1470	7¾	14½	22½	4.4	42	198	204	139.05	131.00
FT-17	FWT-17	...	960	120	235.3	349.8	432	860	1660	8½	14½	22½	4.9	48	237	242	159.80	143.00
FT-19	FWT-19	...	1080	135	265	394	486	945	1845	8½	14½	22½	5.4	54	250	255	163.15	154.50
FT-21	FWT-21	...	1200	150	295	437.8	540	1025	2000	10¼	14½	22½	5.7	60	286	292	174.55	165.60
FT-23	FWT-23	...	1320	165	324	482	594	1100	2145	10¼	14½	22½	6.1	66	299	305	185.90	176.15
FT-29	FWT-29	...	1680	210	413	614	756	1358	2590	13¾	14½	22½	7.4	84	376	392	207.90	197.75

*Includes voltage drop across inter-cell connections used in standard layouts.

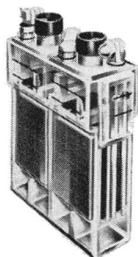
†Discharge rate in amperes to 1.50 volts per cell.

Gould Plastic Jar Batteries
Dreadnaught Types—AS, AT, BS and BT

Antimony Type—CS

Calcium Type—CSC

Capacities—10 to 100 Ampere Hours



AS-54

Charge Indicator Balls: one set per 10 cell for Type AS-52; one set per each MultiUnit, all other types.

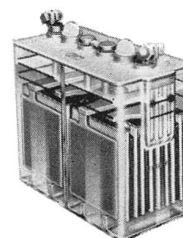
Separators: Porous rubber and perforated retainer.

Terminals: bolted type.

Specific Gravity of Electrolyte: fully charged, 1.215 at 77°F.

InterCell Connectors: lead.

Interunit Connectors: lead tape.



BS-94

Type of Cell	Cells per Unit	Ampere Hour for 8 Hr. Rate of Discharge	CAPACITY AT 77°F.								OVERALL DIMENSIONS INCHES			Electrolyte Gallons per Cell	APPROXIMATE WT., LBS. —PER UNIT—		Price Each
			Amperes for 8 Hrs. to 1.75 F.V.	AMPERES FOR —4 HOURS—		AMPERES FOR —8 HOURS—		AMPERES FOR —12 HOURS—									
				To 1.77 F.V.	To 1.96 F.V.	To 1.77 F.V.	To 1.96 F.V.	To 1.77 F.V.	To 1.96 F.V.								
										Length	Width	Height					
AS-52	1	10	1.25	1.98	0.97	1.23	0.65	0.92	0.50	2 $\frac{5}{8}$	3 $\frac{1}{2}$	7 $\frac{3}{8}$	.1	4	7	\$8.10	
AS-54	2	10	1.25	1.98	0.97	1.23	0.65	0.92	0.50	2 $\frac{5}{8}$	6 $\frac{1}{2}$	7 $\frac{3}{8}$	.1	7.5	13	10.70	
AT-56	3	10	1.25	1.98	0.97	1.23	0.65	0.92	0.50	6 $\frac{3}{16}$	3 $\frac{1}{2}$	7 $\frac{3}{8}$	.1	12	21	15.90	
BS-54	2	15	1.88	2.97	1.45	1.84	0.97	1.38	0.75	2 $\frac{1}{4}$	8 $\frac{1}{16}$	8	.12	10	15	16.40	
BS-56	3	15	1.88	2.97	1.45	1.84	0.97	1.38	0.75	6 $\frac{1}{2}$	4 $\frac{1}{4}$	7 $\frac{13}{16}$	.14	15	22	20.05	
BS-94	2	30	3.75	5.94	2.90	3.68	1.95	2.76	1.50	3 $\frac{13}{16}$	8 $\frac{1}{16}$	8	.22	17	23	20.15	
BT-76	3	30	3.75	5.94	2.90	3.68	1.95	2.76	1.50	8 $\frac{3}{8}$	4 $\frac{3}{16}$	8 $\frac{1}{2}$	.25	27	35	26.65	
*OCS-74	2	50	6.25	10.37	4.75	6.17	3.24	4.54	2.50	5	7 $\frac{1}{2}$	10 $\frac{3}{8}$	.3	28	40	21.50	
*OCS-76	3	50	6.25	10.37	4.75	6.17	3.24	4.54	2.50	7 $\frac{3}{8}$	7 $\frac{1}{2}$	10 $\frac{3}{8}$	.3	41	55	31.00	
*OCS-134	2	100	12.5	20.75	9.50	12.33	6.48	9.10	4.50	8 $\frac{5}{8}$	7 $\frac{1}{2}$	10 $\frac{3}{8}$	.55	55	65	28.00	
*OCS-136	3	100	12.5	20.75	9.50	12.33	6.48	9.10	4.50	12 $\frac{7}{8}$	7 $\frac{1}{2}$	10 $\frac{3}{8}$	.55	71	85	41.30	
*OCSC-74	2	50	6.25	10.37	4.75	6.17	3.24	4.54	2.50	5	7 $\frac{1}{2}$	10 $\frac{3}{8}$	.3	28	40	25.55	
*OCSC-76	3	50	6.25	10.37	4.75	6.17	3.24	4.54	2.50	7 $\frac{3}{8}$	7 $\frac{1}{2}$	10 $\frac{3}{8}$	.3	41	55	39.35	
*OCSC-134	2	100	12.5	20.75	9.50	12.33	6.48	9.10	4.50	8 $\frac{5}{8}$	7 $\frac{1}{2}$	10 $\frac{3}{8}$	.55	55	65	35.90	
*OCSC-136	3	100	12.5	20.75	9.50	12.33	6.48	9.10	4.50	12 $\frac{7}{8}$	7 $\frac{1}{2}$	10 $\frac{3}{8}$	.55	71	85	49.95	

*If indicator balls are desired, remove "O" from prefix.

Gould Rubber Jar Batteries

Extra Capacity, Sealed Tank Type—HWL

Capacities—4000 to 7000 Ampere Hours

NOTE: This type cell should only be lifted with a lifting device, Z-112 which fits under the top sides of the jar; this device is available from Gould.

Special Gravity of Electrolyte: 1.215 at 77°F.

InterCell Connectors: lead plated copper.

Type of Cell	Capacity Ampere Hours	CAPACITY AT 77°F.								OVERALL DIMENSIONS			Electrolyte Gallons per Cell	APPROXIMATE WT., LBS. —PER UNIT—		Price Each
		Ampere for 8 Hrs. to 1.75 F.V.	AMPERES FOR —4 HOURS—		AMPERES FOR —8 HOURS—		AMPERES FOR —12 HOURS—		Length	INCHES		Height		Net	Pack- ed	
			To 1.77 F.V.	To 1.96 F.V.	To 1.77 F.V.	To 1.96 F.V.	To 1.77 F.V.	To 1.96 F.V.		Width						
HWL-21	4000	500	800	410	490	269	361	205	18 $\frac{1}{8}$	12 $\frac{1}{8}$	55 $\frac{1}{2}$	25.6	1085	1235	\$953.24	
HWL-25	5000	625	1000	512	612	336	452	256	18 $\frac{1}{8}$	13 $\frac{7}{8}$	55 $\frac{1}{2}$	29.5	1275	1432	1077.41	
HWL-29	6000	750	1200	615	734	403	543	307	18 $\frac{1}{8}$	16 $\frac{9}{16}$	55 $\frac{1}{2}$	33.5	1465	1630	1235.71	
HWL-35	7000	875	1400	717	858	470	632	358	18 $\frac{1}{8}$	19	55 $\frac{1}{2}$	40.4	1750	1926	1420.30	

Prices are subject to change without notice.

Q-7

Gould Planté Plastic Jar Batteries

Single Cell and MultiUnit Types—DPR, EPR, FPR and CPE

Capacities—8 to 960 Ampere Hours

Single Cells: sealed plastic jars and plastic covers; suspended elements.

Separation: Durapor porous rubber separators.

Posts: Types DPR-5 to EPR-11 have two posts per cell; Types EPR-13 to FPR-25 have four posts per cell.

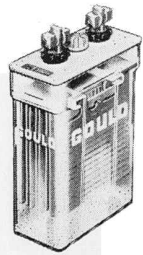
Specific Gravity of Electrolyte: fully charged, 1.210 to 1.220 at 77°F. (25°C.).

Electrolyte: height above plates; Type DPR, $1\frac{1}{8}$ inches; Type EPR, $1\frac{1}{2}$ inches; Type FPR, $2\frac{1}{4}$ inches.

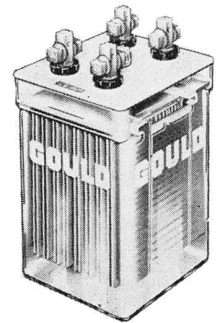
Sediment Space: Type DPR, 2 inches; Type EPR, $1\frac{1}{16}$ inches; Type FPR, $2\frac{1}{16}$ inches.

Average Amperes per Positive Plate: Type DPR, 2.5; Type EPR, 5.0; Type FPR, 10.0

Intercell Connectors: lead plated copper; all cells shipped completely assembled, sealed and charged, with necessary accessories.



DPR-9



EPR-19

Type of Cell	Ampere Hour Capacity 8 Hr. Rate of Discharge	CAPACITY AT 77°F.								OVERALL DIMENSIONS INCHES			Electrolyte Gallons per Cell	APPROXIMATE WT., LBS. PER CELL		Price Each
		Amperes for 8 Hr. to 1.75 F.V.	AMPERES FOR 4 HOURS		AMPERES FOR 8 HOURS		AMPERES FOR 12 HOURS									
			To 1.77 F.V.	To 1.96 F.V.	To 1.77 F.V.	To 1.96 F.V.	To 1.77 F.V.	To 1.96 F.V.								
									Length	Width	Height					
DPR- 5	40	5.0	8.1	3.8	4.9	2.5	3.6	1.9	2 ⁷ / ₁₆	7 ³ / ₈	12 ⁵ / ₈	0.35	18	21	\$21.35	
DPR- 7	60	7.5	12.2	5.8	7.4	3.8	5.4	2.9	4 ¹ / ₁₆	7 ³ / ₈	12 ⁵ / ₈	0.65	26	30	27.35	
DPR- 9	80	10.0	16.2	7.7	9.8	5.1	7.3	3.9	4 ¹ / ₁₆	7 ³ / ₈	12 ⁵ / ₈	0.64	29	33	32.65	
DPR-11	100	12.5	20.0	10.0	12.0	7.0	9.0	5.0	5 ³ / ₈	7 ³ / ₈	12 ⁵ / ₈	0.90	37	41	38.15	
DPR-13	120	15.0	24.0	12.0	15.0	8.0	11.0	6.0	6 ¹ / ₄	7 ¹ / ₂	13 ¹ / ₈	1.01	45	50	42.95	
DPR-15	140	17.5	28.0	14.0	17.0	9.0	13.0	7.0	7 ⁷ / ₁₆	7 ¹ / ₂	13 ¹ / ₈	1.27	52	58	48.35	
DPR-17	160	20.0	32.0	17.0	20.0	11.0	15.0	8.0	7 ⁷ / ₁₆	7 ¹ / ₂	13 ¹ / ₈	1.17	56	61	53.30	
EPR- 9	160	20	32.0	17.0	20.0	11.0	15.0	8.0	6 ⁵ / ₁₆	9 ⁹ / ₁₆	15 ¹ / ₂	1.8	58	64	53.55	
EPR-11	200	25	40.6	19.2	24.6	12.7	18.2	9.7	6 ⁵ / ₁₆	9 ⁹ / ₁₆	15 ¹ / ₂	1.7	69	75	68.05	
EPR-13	240	30	48.7	23.1	29.5	15.3	21.8	11.6	6 ⁵ / ₁₆	9 ⁹ / ₁₆	15 ¹ / ₂	1.6	80	86	79.40	
EPR-15	280	35	56.8	26.8	34.4	17.8	25.4	13.6	7 ¹ / ₁₆	9 ⁹ / ₁₆	15 ¹ / ₂	1.8	90	97	90.45	
EPR-17	320	40	64.9	30.8	39.4	20.4	29.1	15.5	8 ¹ / ₁₆	9 ⁹ / ₁₆	15 ¹ / ₂	2.5	102	110	101.80	
EPR-19	360	45	73.1	34.6	44.2	22.9	32.7	17.4	8 ¹ / ₁₆	9 ⁹ / ₁₆	15 ¹ / ₂	2.4	111	120	111.60	
EPR-21	400	50	81.2	38.5	49.2	25.5	36.4	19.4	10 ¹ / ₈	9 ⁹ / ₁₆	15 ¹ / ₂	2.7	124	133	121.30	
EPR-23	440	55	88.0	45.0	54.0	30.0	40.0	23.0	11 ⁵ / ₈	9 ⁹ / ₁₆	15 ¹ / ₂	3.2	136	145	130.50	
EPR-25	480	60	96.0	49.0	59.0	32.0	43.0	25.0	11 ⁵ / ₈	9 ⁹ / ₁₆	15 ¹ / ₂	3.1	145	154	139.70	
FPR-15	560	70	113.8	53.9	68.9	35.8	51.0	27.1	8 ¹ / ₁₆	13	19 ⁷ / ₈	4.0	180	192	163.55	
FPR-17	640	80	130.0	61.5	78.6	40.7	58.1	31.0	8 ¹ / ₁₆	13	19 ⁷ / ₈	3.7	194	205	183.40	
FPR-19	720	90	146.0	69.2	88.5	45.8	65.5	34.8	9 ¹ / ₁₆	13	19 ⁷ / ₈	5.5	222	234	203.40	
FPR-21	800	100	162.2	77.0	98.3	51.0	72.7	38.7	9 ¹ / ₁₆	13	19 ⁷ / ₈	4.9	236	250	219.35	
FPR-23	880	110	178.8	84.7	108.0	56.1	80.0	42.6	12 ¹ / ₂	13	19 ⁷ / ₈	6.4	270	285	235.10	
FPR-25	960	120	194.8	92.2	118.0	61.3	87.4	46.5	12 ¹ / ₂	13	19 ⁷ / ₈	6.1	287	302	253.15	
*CPE-34	8	1	1.6	0.8	0.98	0.5	0.7	0.4	2 ¹ / ₄	8 ¹ / ₁₆	8 ¹ / ₈	.120	8	13	16.20	
†CPE-36	8	1	1.6	0.8	0.98	0.5	0.7	0.4	6 ³ / ₁₆	4 ⁵ / ₁₆	8 ¹ / ₈	.130	12	17	23.25	
*CPE-54	16	2	3.2	1.6	1.96	1.1	1.4	0.8	2 ¹ / ₄	8 ¹ / ₁₆	8 ¹ / ₈	.115	10	15	19.95	
†CPE-56	16	2	3.2	1.6	1.96	1.1	1.4	0.8	6 ³ / ₁₆	4 ⁵ / ₁₆	8 ¹ / ₈	.115	15	22	28.65	
*CPE-74	24	3	4.8	2.4	2.94	1.6	2.1	1.2	3 ¹ / ₁₆	8 ¹ / ₁₆	8 ¹ / ₈	.115	18	24	24.55	
†CPE-76	24	3	4.8	2.4	2.94	1.6	2.1	1.2	8 ³ / ₈	4 ⁵ / ₁₆	8 ³ / ₄	.160	22	26	35.05	

*Two cells per unit. †Three cells per unit.

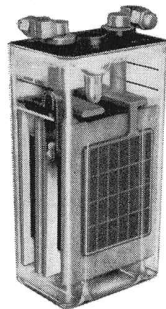
C & D Batteries

Plates have dual insulation consisting of thick fiberglass mat, microporous separators. Plates are extra thick and are both suspended and supported so as to allow normal plate growth. Cells are assembled in clear polystyrene containers. Cells have a Saftee-Vent to guard against the danger of accidental explosion. Sparks or flames cannot enter cell, yet, gasses may pass through freely. Vent also acts as a funnel to simplify water additions and hydrometer readings.

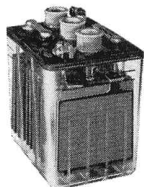
Lead Antimony Grid Batteries

Type A, B, C, D, PKT, KT, LT—10 to 1680 Ampere Hours

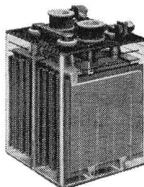
Positive plate thicknesses—all types .266", except PKT, which is .220", and KT and LT which are .312". Specific gravity of electrolyte fully charged 1.200 to 1.220 at 77° F. Long life—C & D's exclusive design combines advantages of both suspended and supported plate construction. Dual insulation; thick fiberglass mat; plastic or rubber separators. High heat resistant crystal clear polystyrene jars. Covers are hermetically sealed; easy visual internal inspection. Saftee-Vent reduces explosion hazard; eliminates necessity of removing vents for water additions or hydrometer readings. Ball cage indicator is available up to 160 A.H., when specified. Intercell connectors are lead plated copper. All cells shipped completely assembled, sealed and charged; with necessary accessories. Racks available, complete information on request. The C & D batteries listed are built in accordance with telephone industry standards.



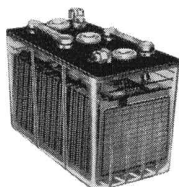
A-10 and B-15



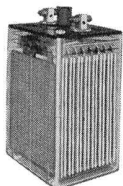
3C-60



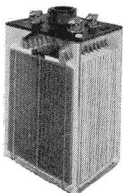
2D-75



3PKT-100



KT-720



LT-1680

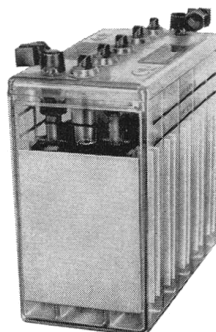
Type of Cell	Cells per Unit	Plates per Cell	AMPERE HOUR CAPACITIES			OVERALL UNIT DIMENSIONS			APPROX. WT., LBS.		Electro. per Cell Lbs.	Price Each
			8 Hrs. to 1.75 V.	3 Hrs. to 1.75 V.	12 Hrs. to 1.75 V.	Lgth.	Width	Ht.	Net Filled	Dom. Packed		
A-10	1	5	10	7.5	11	2½	3⅝	7¾	4	7	1.4	\$ 6.82
2A-10	2	5	10	7.5	11	2½	7¼	7¾	8	11	1.4	10.54
3A-10	3	5	10	7.5	11	7	3⅞	7¾	11	14	1.4	15.50
2A-20	2	9	20	15	22	4⅝	7¼	7¾	13	17	2.5	17.36
B-15	1	5	15	11.3	16.5	2½	3⅝	7¾	6	9	1.4	8.99
2B-15	2	5	15	11.3	16.5	2½	7¼	7¾	9	12	1.4	12.40
3B-15	3	5	15	11.3	16.5	7	3⅞	7¾	12	15	1.4	16.12
2B-30	2	9	30	22.5	33	4⅝	7¼	7¾	15	19	2.5	19.84
2C-50	2	7	50	37.5	55	6⅞	7⅝	10	29	39	3.5	25.42
3C-50	3	7	50	37.5	55	9	7⅝	10	44	57	3.5	36.58
2C-60	2	7	60	45	66	6⅞	7⅝	10	29	39	3.5	27.90
3C-60	3	7	60	45	66	9	7⅝	10	44	57	3.5	40.30
2D-75	2	7	75	56	82.5	7½	7⅞	10⅝	40	47	6.5	32.24
3D-75	3	7	75	56	82.5	11⅞	7⅞	10⅝	60	68	6.5	44.02
2D-100	2	9	100	75	110	7½	7⅞	10⅝	44	51	5.5	37.20
3D-100	3	9	100	75	110	11⅞	7⅞	10⅝	65	73	5.5	48.98
D-125	1	11	125	94	137.5	7½	7⅞	10⅝	37	44	15.0	27.90
D-150	1	13	150	113	165	7½	7⅞	10⅝	40	47	14.0	29.14
D-175	1	15	175	131	192.5	7½	7⅞	10⅝	42	49	12.5	31.62
D-200	1	17	200	150	220	7½	7⅞	10⅝	44	51	11.5	34.10
2PKT-50	2	7	50	37.5	55	5	7¼	10	28	38	3.5	22.32
3PKT-50	3	7	50	37.5	55	7⅝	7¼	10	42	55	3.5	32.24
2PKT-100	2	13	100	75	110	9	7⅝	10	46	60	6.0	29.14
3PKT-100	3	13	100	75	110	13⅝	7⅝	10	67	81	6.0	42.78
2KT-180	2	5	180	132	198	5⅞	10⅞	18⅞	86	104	13	75.64
3KT-180	3	5	180	132	198	8⅞	10⅞	18⅞	128	150	13	101.68
KT-270	1	7	270	198	297	3⅝	10⅞	18⅞	57	74	15	41.54
KT-300	1	7	300	220	330	4⅝	10⅞	18⅞	69	85	22	50.84
KT-360	1	9	360	264	396	4⅝	10⅞	18⅞	77	95	20	61.69
KT-450	1	11	450	330	495	5⅞	10⅞	18⅞	94	112	24.5	69.13
KT-480	1	11	480	352	528	6⅞	10⅞	18⅞	103	122	31	75.64
KT-540	1	13	540	396	594	6⅞	10⅞	18⅞	111	131	29	83.08
KT-660	1	15	660	485	726	8⅞	10⅞	18⅞	136	158	40	98.89
KT-720	1	17	720	528	792	8⅞	10⅞	18⅞	143	165	38	118.90
LT-840	1	11	840	615	924	7⅝	14⅞	22⅝	183	213	65	130.82
LT-1008	1	13	1008	738	1109	7⅝	14⅞	22⅝	200	230	63	142.60
LT-1176	1	15	1176	861	1294	7⅝	14⅞	22⅝	217	247	60	154.38
LT-1344	1	17	1344	984	1478	8⅞	14⅞	22⅝	249	281	71	176.08
LT-1512	1	19	1512	1107	1663	10⅝	14⅞	22⅝	287	326	87	187.24
LT-1680	1	21	1680	1230	1848	10⅝	14⅞	22⅝	304	343	84	197.47

NOTE: Electrolyte weighs approximately 10 pounds per gallon.

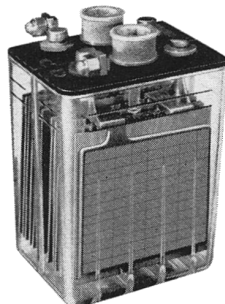
Prices are subject to change without notice.

Q-9

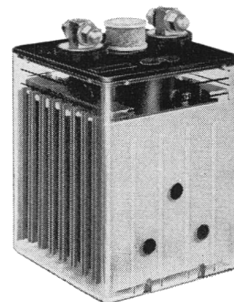
C & D Batteries
Lead-Calcium Grid Batteries
Types AAC, PCC, DC—6 to 200 Ampere Hours



5AAC-6



PCC-50



DC-200

This outstanding battery combines a durable clear-plastic container with revolutionary lead-calcium grids. The alloying of pure lead with calcium gives these grids a tensile strength equal to that of grids containing a high percentage of antimony, but with none of the harmful effects of antimony.

Delivers a high output throughout life. Rated capacity remains steady because the negative plates stay healthy, active, and free from contamination.

Reduces the frequency of equalizing charges, because there is no antimony in the battery to cause low cells through antimony poisoning of the negative plates.

PlastiCal's rate of self-discharge stays low, its capacity high. The amount of calcium in the grids is controlled to within plus or minus 20/1000ths of 1 per cent. The resultant uniformity in the grids means uniform cells, uniform operation.

Works five times as long without needing water. PlastiCals consume less current, there is less electrolysis of water, which in turn means fewer inspections, fewer water additions.

Positive plate thicknesses—all types .266".

Specific gravity of electrolyte fully charged 1.200 to 1.220 at 77°F.

Long life is C & D's exclusive design; combines advantages of both suspended and supported plate construction.

Dual insulation; thick fiberglass mat; plastic or rubber separators.

High heat resistant crystal-clear polystyrene jars.

Covers are hermetically sealed; easy visual internal inspection.

Saftee-Vent reduces explosion hazard; eliminates necessity of removing vents for water additions or hydrometer readings.

Ball cage indicator available up to 160 A.H. when specified. Intercell connectors are lead plate copper. All cells shipped completely assembled, sealed and charged; with necessary accessories.

Racks available, complete information on request.

The C & D batteries listed are built in accordance with telephone industry standards.

Type of Cell	Cells per Unit	Plates per Cell	AMPERE HOUR CAPACITIES				OVERALL UNIT DIMENSIONS INCHES			APPROX. WT., LBS. PER UNIT		Electro. per Cell Lbs.	Price Each
			8 Hrs. to 1.75 V.	3 Hrs. to 1.75 V.	12 Hrs. to 1.75 V.	72 Hrs. to 1.85 V.	Lgth.	Width	Ht.	Net Filled	Dom. Packed		
5AAC-6	5	6	6	4	6.9	9.4	6 ⁹ / ₁₆	3 ³ / ₈	7	9 ¹ / ₂	11	2.5	\$20.77
2PCC-50	2	7	50	37.5	55	70	6 ¹ / ₈	7 ³ / ₈	10	29	39	3.5	29.76
3PCC-60	3	7	50	37.5	55	70	9	7 ³ / ₈	10	44	57	3.5	41.54
2PCC-60	2	7	60	45	66	84	6 ¹ / ₈	7 ³ / ₈	10	29	39	3.5	32.24
3PCC-60	3	7	60	45	66	84	9	7 ³ / ₈	10	44	57	3.5	45.88
2DC-75	2	7	75	56	82.5	112.5	7 ¹ / ₂	7 ³ / ₁₆	10 ³ / ₈	40	47	6.5	34.72
3DC-75	3	7	75	56	82.5	112.5	11 ¹ / ₈	7 ³ / ₁₆	10 ³ / ₈	60	68	6.5	47.74
2DC-100	2	9	100	75	110	150	7 ¹ / ₂	7 ³ / ₁₆	10 ³ / ₈	44	51	5.5	39.68
3DC-100	3	9	100	75	110	150	11 ¹ / ₈	7 ³ / ₁₆	10 ³ / ₈	65	73	5.5	53.94
DC-125	1	11	125	94	137.5	187.5	7 ¹ / ₂	7 ³ / ₁₆	10 ¹⁵ / ₁₆	37	44	15.0	29.76
DC-150	1	13	150	113	165	225	7 ¹ / ₂	7 ³ / ₁₆	10 ¹⁵ / ₁₆	40	47	14.0	32.86
DC-175	1	15	175	131	192.5	262.5	7 ¹ / ₂	7 ³ / ₁₆	10 ¹⁵ / ₁₆	42	49	12.5	35.34
DC-200	1	17	200	150	220	300	7 ¹ / ₂	7 ³ / ₁₆	10 ¹⁵ / ₁₆	44	51	11.5	37.20

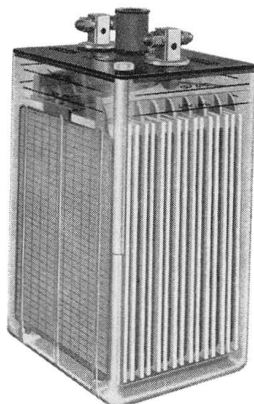
NOTE: Electrolyte weighs approximately 10 pounds per gallon.

Prices are subject to change without notice.

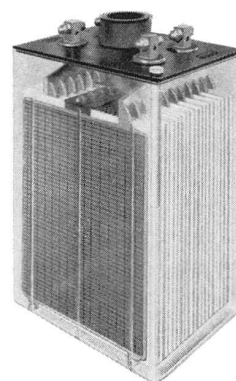
C & D Batteries

Lead-Calcium Grid Batteries

Types KCT, LCT—180 to 1680 Ampere Hours



KCT-720



LCT-1680

Positive plate thicknesses—all types .312".

Specific gravity of electrolyte fully charged 1.200 to 1.220 at 77°F.

Long life is C & D's exclusive design; combines advantages of both suspended and supported plate construction.

Dual insulation; thick fiberglass mat; plastic or rubber separators.

High heat resistant crystal-clear polystyrene jars, covers are hermetically sealed; easy visual internal inspection. Plastite post seals. Saftee-Vent reduces explosion hazard; eliminates necessity of removing vents for water additions or hydrometer readings.

Ball cage indicator available up to 160 A.H. when specified.

Intercell connectors; lead plated copper. All cells shipped completely assembled, sealed and charged; with necessary accessories. Racks available, complete information on request.

The C & D batteries listed are built in accordance with telephone industry standards.

Type of Cell	Cells per Unit	Plates per Cell	AMPERE HOUR CAPACITIES			OVERALL UNIT DIMENSIONS			APPROX. WT., LBS. PER UNIT		Electro. per Cell Lbs.	Price Each
			8 Hrs. to 1.75V.	3 Hrs. to 1.75V.	12 Hrs. to 1.75V.	Lgth.	Width	Ht.	Net Filled	Dom. Packed		
2KCT-180	2	5	180	132	198	5 ¹⁹ / ₃₂	10 ⁷ / ₁₆	18 ⁷ / ₃₂	86	104	13	\$89.90
3KCT-180	3	5	180	132	198	8 ¹⁷ / ₃₂	10 ⁷ / ₁₆	18 ⁷ / ₃₂	128	150	13	129.58
KCT-270	1	7	270	198	297	3 ⁵ / ₈	10 ⁷ / ₁₆	18 ⁷ / ₃₂	57	74	15	54.56
KCT-300	1	7	300	220	330	4 ⁵ / ₈	10 ⁷ / ₁₆	18 ⁷ / ₃₂	69	85	22	63.24
KCT-360	1	9	360	264	396	4 ⁵ / ₈	10 ⁷ / ₁₆	18 ⁷ / ₃₂	77	95	20	74.20
KCT-450	1	11	450	330	495	5 ¹⁹ / ₃₂	10 ⁷ / ₁₆	18 ⁷ / ₃₂	94	112	24.5	80.60
KCT-480	1	11	480	352	528	6 ¹⁹ / ₃₂	10 ⁷ / ₁₆	18 ⁷ / ₃₂	103	122	31	91.45
KCT-540	1	13	540	396	594	6 ¹⁹ / ₃₂	10 ⁷ / ₁₆	18 ⁷ / ₃₂	111	131	29	96.72
KCT-660	1	15	660	485	726	8 ¹⁷ / ₃₂	10 ⁷ / ₁₆	18 ⁷ / ₃₂	136	158	40	113.46
KCT-720	1	17	720	528	792	8 ¹⁷ / ₃₂	10 ⁷ / ₁₆	18 ⁷ / ₃₂	143	165	38	132.68
LCT-840	1	11	840	615	924	7 ⁵ / ₈	14 ¹ / ₈	22 ⁵ / ₈	183	213	65	138.88
LCT-1008	1	13	1008	738	1109	7 ⁵ / ₈	14 ¹ / ₈	22 ⁵ / ₈	200	230	63	157.48
LCT-1176	1	15	1176	861	1294	7 ⁵ / ₈	14 ¹ / ₈	22 ⁵ / ₈	217	247	60	162.44
LCT-1344	1	17	1344	984	1478	8 ⁷ / ₈	14 ¹ / ₈	22 ⁵ / ₈	249	281	71	183.52
LCT-1512	1	19	1512	1107	1663	10 ⁵ / ₈	14 ¹ / ₈	22 ⁵ / ₈	287	326	87	195.92
LCT-1680	1	21	1680	1230	1848	10 ⁵ / ₈	14 ¹ / ₈	22 ⁵ / ₈	304	343	84	207.70

NOTE: Electrolyte weighs approximately 10 pounds per gallon.

Rubber Jar Batteries

Type RHA—4000 to 7000 Ampere Hours

Specific gravity 1.215 at 77°F.

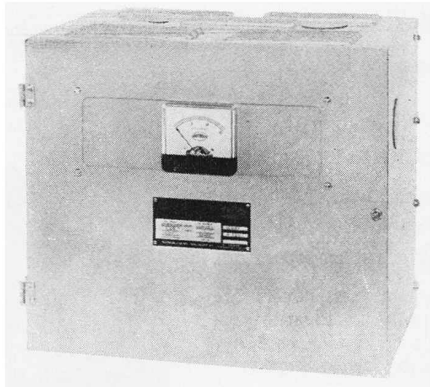
Containers, molded rubber. Cell covers, Hi impac rubber. Separators, microporous. Intercell connectors, lead plated copper. Posts, copper core.

Type of Cell	Cells per Unit	Plates per Cell	AMPERE HOUR CAPACITIES			OVERALL UNIT DIMENSIONS			APPROX. WT., LBS. PER UNIT		Electro. per Cell Lbs.	Price Each
			8 Hrs. to 1.75V.	3 Hrs. to 1.75V.	12 Hrs. to 1.75V.	INCHES			Net Filled	Dom. Packed		
						Lgth.	Width	Ht.				
RHA-4000	1	21	4000	2700	4400	18 $\frac{1}{8}$	14 $\frac{3}{16}$	55 $\frac{3}{4}$	1030	1160	292.6	\$899.00
RHA-5000	1	25	5000	3450	5500	18 $\frac{1}{8}$	14 $\frac{3}{16}$	55 $\frac{3}{4}$	1185	1325	312.8	1023.00
RHA-6000	1	29	6000	4150	6600	18 $\frac{1}{8}$	16 $\frac{5}{16}$	55 $\frac{3}{4}$	1325	1480	363.1	1128.40
RHA-7000	1	35	7000	4800	7700	18 $\frac{1}{8}$	19 $\frac{7}{16}$	55 $\frac{3}{4}$	1660	1830	433.9	1320.60

NOTE: This type cell should only be lifted with lifting device furnished, which fits under top sides of jars.

Prices are subject to change without notice.

Raytheon RectiFilterR



Provides humless D.C. power directly from an A.C. source. Designed especially for PBX's, the RectiFilterR has also found widespread use in the powering of key equipment, intercommunicating systems and as a battery booster on long lines. The 1.0 ampere and larger sizes include an exclusive D.C. voltage stabilizing circuit which insures steady voltage under conditions of changing load. RectiFilterR units with a suffix R in the model number are supplied with a relay which automatically connects to a source of standby power in case of A.C. power failure. Input voltage is 110-125 V.

6-Volt Battery Eliminators

Type	D.C. OUTPUT (TALK SUPPLY)		A.C. OUTPUT (60 CYCLES) (SIGNALLING SUPPLY)		Price Each
	Volts	Amps.	Volts	Amps. (Int.)	
RF1024C	6	0.5	6, 10, 18, 24	4.0	\$42.00
RF1024CR	6	0.5	6, 10, 18, 24	4.0	46.00

24-Volt Battery Eliminators

RF1027C	24	0.5	6, 10, 18, 24	4.0	\$50.00
RF1027CR	24	0.5	6, 10, 18, 24	4.0	54.00
RF1044GR	24	1.0	6-24; 75-100	4.0	143.00
RF1044HR	24	1.0	.....	...	126.00
RF1043AR	24	1.5	6-24; 75-100	4.0	200.00
RF1040A	24	3.0	18, 24	3.0	194.00
RF1040AR	24	3.0	18, 24	3.0	165.00
RF1041AR	24	4.0	18, 24	3.0	220.00
RF1042AR	24	6.0	18, 24	3.0	320.00

48-Volt Battery Eliminators

RF1079AR	48	4.0	48	4.0	\$310.00
RF1080AR	48	6.0	48	6.0	372.00

± 110-Volt Toll Ticketing Supply

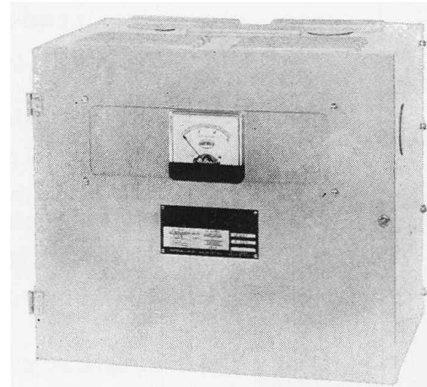
RF1071BR	± 110	0.75		...	\$163.00
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Raytheon RectiRingerR

A combination battery-eliminator, (24-volt, 1 ampere), and 20-cycle ringer in one compact unit, operating entirely without moving parts. The RectiRingerR is both quiet and efficient, and has been provided with self-protection on overloads.

Type	D.C. OUTPUT (TALK SUPPLY)		A.C. OUTPUT (60 CYCLES) (SIGNALLING SUPPLY)		Price Each
	Volts	Amps.	Volts	Amps. (Int.)	
RRR1244AR	24	1.0	{ 85 Volts @ 20 Cycles .050 10 Volts @ 60 Cycles 4.000 }		\$163.00

Raytheon RectiChargeR



Completely automatic, follow-the-load battery charger for use on systems employing 11/12 or 22/26 cells of battery. Operates without any moving parts; delivers smooth, humless D.C. power to switchboard and batteries directly from an A.C. source. Supplies all D.C. power required by load at same time, furnishing battery with a trickle charge to make up for internal losses. Automatically recharges battery to a full-float condition while supplying switchboard load. Output D.C. is maintained constant out to full-load with line voltage variations of ± 10 per cent.

Rugged components will give years of trouble-free service.

Furnished in an attractive gray cabinet; comes complete, ready to install on relay rack, wall or floor.

24-Volt Constant Voltage (Filtered)

Type	INPUT		Out- put Amps.	Cells (Lead- Acid)	Mount- ing	Price Each
	Volts	Phase				
RC24A1	115	1	1	11/12	W-F	\$210.00
RC24A3	115	1	3	11/12	W-F	265.00
RC24A6	115	1	6	11/12	W-F	306.00

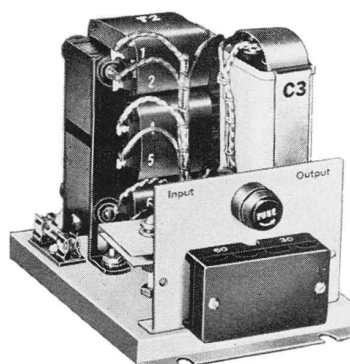
50-Volt Constant Voltage (Filtered)

RC50A1	115	1	1	22-24	W-F	\$265.00
RC50A3	115	1	3	22-25	RR-W-F	300.00
RC50A6	115	1	6	22-25	RR-W-F	494.00
RC50A9	115/230	1	9	23-26	RR-W-F	550.00
RC50A12	115/230	1	12	23-25	RR-W-F	795.00
RC50A18	115/230	1	18	23-26	RR-W-F	890.00
RC50A25	115/230	1	25	23-26	RR-W-F	1270.00
RC50K25	208/225/240	3	25	23-26	RR-W-F	1460.00
RC50K50	208/225/240	3	50	23-26	RR-F	1850.00
RC50K75	208/225/240	3	75	23-26	F	2525.00
RC50K100	208/225/240	3	100	23-26	F	2870.00
RC50K150	208/225/240	3	150	23-26	F	3775.00
RC50K200	208/225/240	3	200	23-26	F	4280.00
RC50K400	208/225/240	3	400	23-26	F	5990.00

50-Volt Constant Current (Filtered)

CC50A3	115/230	1	3	.....	RR-W	\$238.00
CC50A6	115/230	1	6	.....	RR-W	342.00
CC50A12	115/230	1	12	.....	RR-W	505.00
CC50A25	115/230	1	25	.....	RR-W	779.00

Lorain Biased Core Sub-Cycle Converters


Type BC20X

Type BC30X

Converters use metallic rectifiers to bias the core of saturable inductances.

Self-starting and operate without moving parts.

They are characterized by instant starting with low inrush current, protection on overload, reserve capacity, regulated

output ringing voltage, d-c. path for superimposed ringing and, of course, by ever-important fixed frequency output.

There are two types: 20-cycle and 30-cycle; all operable from 105-125-volt, 60-cycle supply.

20-Cycle Output

Type	Recommended No. of Stations	No Load Volts	F.L. Watts	Size Inches	Price Each
BC20X	PBX 1 Position	90	3.5	5¼x8½x8½	\$66.84
BC20M19	100 or Less	88, 101	8.5	*7	180.32
BC20M23	100 or Less	88, 101	8.5	†5¼	180.32
BC20S19	1600	88, 101, 110	20	*10½	213.64
BC20S23	1600	88, 101, 110	20	†8	213.64
BC20C19	4000	88, 101, 110	40	*10½	250.68
BC20C23	4000	88, 101, 110	40	†8¾	295.96

30-Cycle Output

Type	Recommended No. of Stations	No Load Volts	F.L. Watts	Size Inches	Price Each
BC30X	PBX 1 Position	110	5	5x4½x6¾	\$36.65
BC30M	100 or Less	90	7.5	5¼x8½x8½	75.46
BC30S	1600	90, 120	20	5¼x8½x12¼	96.04
BC30C	4000	90, 130	60	5¼x8½x13¾	117.21

*Space on 19-inch relay rack.

†Space on 23-inch relay rack.

Lorain 20-Cycle D-C. Operated Transistorized Sub-Cycle Ringing Converters

Circuits in all models listed below include transistors which operate from office battery to generate required frequency.

The output wave shape is approximately sinusoidal and the output voltage is regulated.

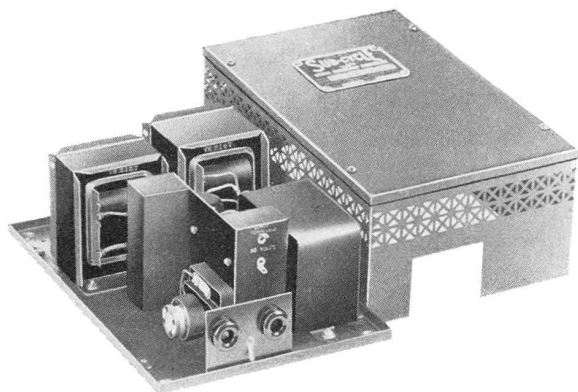
With 24 or 48-volt office battery input they provide stable frequency output, the drift being on the order of ±1-cycle with a change of input voltage from 22 to 26 volts or 46 to 52 volts and load change from no load to full rated load.

Type	No. of Stations Up To	D-C. Input Volts	Full Load Output Watts	No Load Output Volts	Overall Dimensions Inches	Ship. Wt. Lbs.	Price Each
TA20M	100	24	7.5	100	8x8½x5¼	17	\$131.32
TA20S19	2500	24	25.0	90/110	19x5¼x6¾	31	156.20
TB20C23	5000	48	50.0	90/110	23x6½x6¾	48	231.88
TB20M	100	48	7.5	100	8x8½x5¼	17	145.04
TB20M23	100	48	7.5	100	23x3¾x4¾	20	148.96
TB20S23	2500	48	25.0	90/110	23x5¼x5	35	181.30

Prices are subject to change without notice.

Q-13

Lorain Relay Start Sub-Cycle Frequency Converters



Type S60

Operates without moving parts. They supply an output frequency which is a fixed fraction of input frequency. Regular models supply one-third input frequency of 20-cycle ringing current when powered from a 60-cycle line or 16 $\frac{2}{3}$ -cycle current when supplied from a 50-cycle line.

NOTES: 1. The below models with suffix —50 instead of —60 are available for 50-cycle operation; prices furnished on request.

2. Higher output ringing voltages are obtainable by means of auxiliary transformers. Also output transformers are available to provide a direct current path for superimposed ringing. For 230-volt input use auxiliary stepdown transformers.

3. An additional variety of Special Relay Start Sub-Cycles is available for special duties.

For Operation from 60-Cycle, Single Phase

Type	No. of Stations Up To	Duty Ringing	20-CY. OUTPUT IN RMS. UNLESS STATED—				Size Inches	Price Each
			Input Volts	No Load	Full Load	Watts		
‡M7.5-60	100	Light	105-125	90	75	7.5	6 $\frac{5}{8}$ x 5 $\frac{1}{8}$ x11 $\frac{1}{4}$	\$76.83
‡BX60	1600	Regular	105-125	90	75	15-20	5 $\frac{3}{4}$ x 9 $\frac{5}{8}$ x14 $\frac{1}{8}$	113.48
‡S60	1600	Regular	105-125	90	75	15-20	5 $\frac{3}{4}$ x 9 $\frac{5}{8}$ x14 $\frac{1}{8}$	86.04
§S1-60	1600	Regular	105-125	90	75	15-20	5 $\frac{3}{4}$ x 9 $\frac{5}{8}$ x14 $\frac{1}{8}$	88.00
SP60	1600	{Regular w. Pulstg.}	105-125	{90 110 Peak}	{75 90 Peak}	15-20	5 $\frac{3}{4}$ x 9 $\frac{5}{8}$ x14 $\frac{1}{8}$	98.39
‡CC60	4000	Heavy	{105-125/ 210-250}	90/130	75/100	45	8 $\frac{1}{4}$ x10 $\frac{3}{4}$ x16 $\frac{3}{8}$	162.29
||CC1-60	4000	Heavy	{105-125/ 210-250}	90/130	75/100	45	8 $\frac{1}{4}$ x10 $\frac{3}{4}$ x16 $\frac{3}{8}$	164.84
‡CCR60	4000	Heavy	{105-125/ 210-250}	90/130	75/100	45	8 $\frac{1}{4}$ x10 $\frac{3}{4}$ x16 $\frac{3}{8}$	162.29
CCP60	4000	{Heavy w. Pulstg.}	{105-125/ 210-250}	{90 or 130, 160 Peak}	{75 or 100, 120 Peak}	45	8 $\frac{1}{4}$ x10 $\frac{3}{4}$ x16 $\frac{3}{8}$	186.79

‡Saturable shunt choke should be added to these Sub-Cycles if ringing loads are highly inductive to prevent excessive operation of the Sub-Cycle starting relay. §Arranged for operating with or without capacitor. ||Arranged for operating with or without output capacitor. †Has resistor, instead of capacitor, in output circuit.

Lorain Transformers and Saturable Shunt Chokes

For Use with Sub-Cycles

Type	Description	Used With	Price Each	Type	Description	Used With	Price Each
8G	90-130 V. Transformer for Superimposed Ringing	S60, BX60	\$13.20	80G	Booster Transformer or 1:1 Isolation Trans. with 40 VA Capacity	S50, S60	\$17.05
9G	Step-Up Output Transformer for Voltages from 90 to 300 Volts	CC60	34.20	81G	230/115 Volts, 50/60 Cycles 150 VA Autotransformer	M, S or BX	22.15
13G	Same as 81G, but 1.5 KVA		65.40	501G	Same as 8G	CC60, BC20C	59.00
25G	Same as 8G	S50, BX50, SGB50	16.00	692G	Same as 8G	M7.5-60	17.05
66G	Same as 81G, but 1 KVA		62.60	845G	Same as 8G	M7.5-50	17.05
77G	Same as 8G, with Additional 90-Volt 200 MA. Winding	S60, BX60	32.00				

Lorain Saturable Shunt Chokes

For Use with Sub-Cycles

To prevent relay operation when ringing on inductive loads.

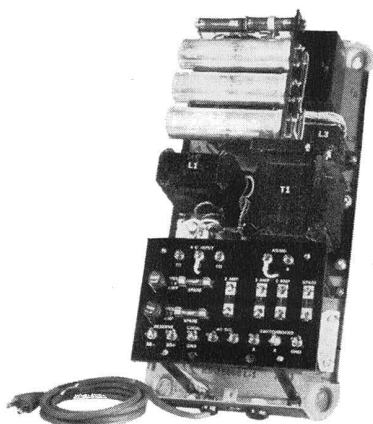
Type	Used With	Price Each	Type	Used With	Price Each
22G	BX60	\$9.00	231G	{CC60, 90-Volt Tap}	\$14.50
23G	{M7.5-60, M7.5-50}	13.40	232G	{CC60, 130-Volt Tap}	16.66
26G	S60	7.20			

Prices are subject to change without notice.

Lorain T Power Units

T for Talking and Most of Them with a Supply for Signaling

For PBX and Small Switchboards



Type T2A



Type T10

- NOTES: 1. Types T4-19, T7, T7R, T8, T8R, T9, T10, T10R, RT5-19A, RT5-19-50 and RT9-19A are gray finished; Types T2A and RT6 are beige-gray wrinkle finished; Types T8T and T14T are equipment gray epoxy finish; all remaining Types are gray-green wrinkle finished.
2. Types RT3B50, RT5-19-50 and T1B50 operate with 50-cycle input; Types T3, T3R, T4, T4-19, T5B, T5BR, T6, T6R, T7, T7R, T8, T8A and T8R operate with either 50 or 60-cycle input; all other units operate on 60-cycle only.
3. Transistorized models having the suffix "T" operate on d-c., 48 volt input.

Type	D-C. Talking Output	Signaling A-C. and D-C.	Cabinet Size Inches	Ship. Wt. Lbs.	Price Each
T1B	1.0 Amp. 21 V.	{ 8.0 Amp. 10 V. 60 Cy.—0.5 Amp. 20 V. 60 Cy.—2.0 Amp. 23 V. D-C. }	8 $\frac{7}{8}$ x 13 $\frac{7}{8}$ x5 $\frac{1}{4}$	15	\$70.95
T1B50	1.0 Amp. 21 V.	{ 8.0 Amp. 10 V. 50 Cy.—0.5 Amp. 20 V. 50 Cy.—2.0 Amp. 23 V. D-C. }	8 $\frac{7}{8}$ x 13 $\frac{7}{8}$ x5 $\frac{1}{4}$	17	78.01
T2A	1.5 Amp. 40 V.	1.5 Amp. 10 or 20 V. 60 Cy.	8 $\frac{5}{8}$ x17 $\frac{5}{8}$ x5 $\frac{1}{4}$	35	154.84
T2B	4.0 Amp. 24 or 34 V.	{ 10 Amp. 10 V. 60 Cy.—0.5 Amp. 20 V. 60 Cy. }	8 $\frac{5}{8}$ x13 $\frac{7}{8}$ x5 $\frac{1}{4}$	27	126.81
*T2C	4.0 Amp. 24 or 34 V.	{ 10 Amp. 10 V. 60 Cy.—0.5 Amp. 20 V. 60 Cy. }	8 $\frac{5}{8}$ x13 $\frac{7}{8}$ x5 $\frac{1}{4}$	27	128.58
T2T	6.0 Amp. 24 V.	5 V. 10 V. 15 Amp. P.D.C.	19 x 9 $\frac{5}{8}$ x7	39	421.40
T3	0.5 Amp. 24 V.	4.0 Amp. 6-10-18-24 V. 60 Cy.	8 x 8 $\frac{7}{8}$ x5 $\frac{1}{4}$	19	58.41
†T3R	0.5 Amp. 24 V.	4.0 Amp. 6-10-18-24 V. 60 Cy.	8 x 8 $\frac{7}{8}$ x5 $\frac{1}{4}$	19	66.25
T4	1.0 Amp. 48 V.	1.5 Amp. 10 or 20 V. 60 Cy.	8 $\frac{5}{8}$ x13 $\frac{7}{8}$ x5 $\frac{1}{4}$	27	117.01
T4-19	1.0 Amp. 48 V.	1.5 Amp. 10 or 20 V. 60 Cy.	6 $\frac{1}{2}$ x19x6	33	137.20
T5B	1.5 Amp. 12 V.	4.0 Amp. 6-10-18-24 V. 60 Cy.	8 x 8 $\frac{7}{8}$ x5 $\frac{1}{4}$	17	60.76
†T5BR	1.5 Amp. 12 V.	4.0 Amp. 6-10-18-24 V. 60 Cy.	8 x 8 $\frac{7}{8}$ x5 $\frac{1}{4}$	18	68.60
T6	1.0 Amp. 6 V.	4.0 Amp. 6-10-18-24 V. 60 Cy.	8 x 8 $\frac{7}{8}$ x5 $\frac{1}{4}$	17	52.33
†T6R	1.0 Amp. 6 V.	4.0 Amp. 6-10-18-24 V. 60 Cy.	8 x 8 $\frac{7}{8}$ x5 $\frac{1}{4}$	18	60.17
T7	.....	.25 Amp. ±120 V. D-C.	8 $\frac{5}{8}$ x12 $\frac{1}{4}$ x5 $\frac{1}{4}$	20	141.12
†T7R	.....	.25 Amp. ±120 V. D-C.	8 $\frac{5}{8}$ x12 $\frac{1}{4}$ x5 $\frac{1}{4}$	21	152.88
T8	.....	.25 Amp. ±45 V. D-C.	8 $\frac{5}{8}$ x12 $\frac{1}{4}$ x5 $\frac{1}{4}$	18	88.79
T8A	.....	.25 Amp. ±35-45-67 V. D-C.	8 $\frac{5}{8}$ x12 $\frac{1}{4}$ x5 $\frac{1}{4}$	19	117.60
†T8R	.....	.25 Amp. ±35-45-67 V. D-C.	8 $\frac{5}{8}$ x12 $\frac{1}{4}$ x5 $\frac{1}{4}$	20	103.88
T8T	.....	.25 Amp. 35-40-45-50 V.	19 x 3 $\frac{1}{2}$ x8 $\frac{1}{2}$	19	235.20
T9	1.0 Amp. 6 V.	.....	4 $\frac{7}{8}$ x 4 $\frac{1}{8}$ x6 $\frac{7}{8}$	7	31.36
T10	.....	.25 Amp. 120 V. D-C.	8 $\frac{5}{8}$ x12 $\frac{1}{4}$ x5 $\frac{1}{4}$	15	82.32
†T10R	.....	.25 Amp. 120 V. D-C.	8 $\frac{5}{8}$ x12 $\frac{1}{4}$ x5 $\frac{1}{4}$	17	90.16
T14	.....	.15 Amp. 190 V. D-C.	8 x 7 $\frac{1}{2}$ x5 $\frac{1}{4}$	12	59.78
†T14T	.....	.15 Amp. 190 V. D-C.	19 x 8 $\frac{1}{2}$ x3 $\frac{1}{2}$	14	254.80

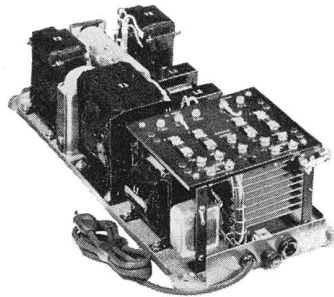
*With common ground, 2-prong plug. †With built-in change of source relay.
‡Operates from 48-volt office battery, transistorized circuitry.

Prices are subject to change without notice.

Q-15

Lorain RT Power Pack Units

R for Ringing, T for Talking and with Output for Signaling
For PBX and Small Switchboards



Type RT2B



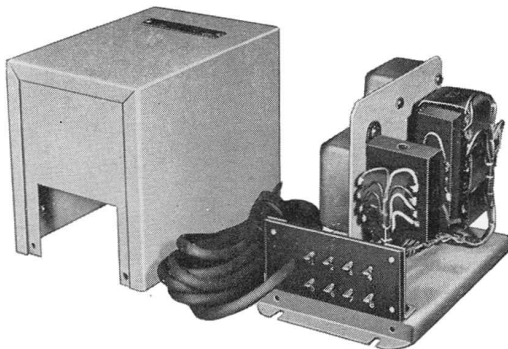
Type RT3B

Type	Ringing Output	Talking D-C. Supply	Signaling A-C. and D-C.	Cabinet Size Inches	Ship. Wt. Lbs.	Price Each
RT1B	{ 50 MA. 90 V. 20 Cy.	1.0 Amp. 21 V.	8.0 Amp. 10 V. 60 Cy.—0.5 Amp. 20 V. 60 Cy.—2.0 Amp. 23 V. D-C.	8 $\frac{5}{8}$ x13 $\frac{7}{8}$ x5 $\frac{1}{4}$	28	\$124.46
RT2B	{ 50 MA. 90 V. 20 Cy.	4.0 Amp. 24 or 34 V.	10 Amp. 10 V. 60 Cy.—0.5 Amp. 20 V. 60 Cy.	8 $\frac{5}{8}$ x17 $\frac{5}{8}$ x5 $\frac{1}{4}$	40	176.99
*RT2C	{ 50 MA. 90 V. 20 Cy.	4.0 Amp. 24 or 34 V.	10 Amp. 10 V. 60 Cy.—0.5 Amp. 20 V. 60 Cy.	8 $\frac{5}{8}$ x17 $\frac{5}{8}$ x5 $\frac{1}{4}$	42	178.75
† RT2D	{ 50 MA. 90 V. 20 Cy.	4.0 Amp. 24 or 34 V.	10 Amp. 10 V. 60 Cy.—0.5 Amp. 20 V. 60 Cy.	8 $\frac{5}{8}$ x17 $\frac{5}{8}$ x5 $\frac{1}{4}$	44	190.12
† RT2E	{ 50 MA. 90 V. 20 Cy.	4.0 Amp. 24 or 34 V.	10 Amp. 10 V. 60 Cy.—0.5 Amp. 20 V. 60 Cy.	8 $\frac{5}{8}$ x17 $\frac{5}{8}$ x5 $\frac{1}{4}$	44	191.88
RT3B	{ 50 MA. 110 V. 30 Cy.	1.0 Amp. 21 V.	8.0 Amp. 10 V. 60 Cy.—0.5 Amp. 20 V. 60 Cy.—2.0 Amp. 23 V. D-C.	8 $\frac{5}{8}$ x12 $\frac{1}{4}$ x5 $\frac{1}{4}$	19	96.04
RT3B50	{ 50 MA. 110 V. 25 Cy.	1.0 Amp. 21 V.	8.0 Amp. 10 V. 50 Cy.—0.5 Amp. 20 V. 50 Cy.—2.0 Amp. 23 V. D-C.	8 $\frac{5}{8}$ x12 $\frac{1}{4}$ x5 $\frac{1}{4}$	20	110.54
RT4B	{ 50 MA. 110 V. 30 Cy.	4.0 Amp. 24 or 34 V.	10 Amp. 10 V. 60 Cy.—0.5 Amp. 20 V. 60 Cy.	8 $\frac{5}{8}$ x17 $\frac{5}{8}$ x5 $\frac{1}{4}$	31	147.78
† RT4BR	{ 50 MA. 110 V. 30 Cy.	4.0 Amp. 24 or 34 V.	10 Amp. 10 V. 60 Cy.—0.5 Amp. 20 V. 60 Cy.	8 $\frac{5}{8}$ x17 $\frac{5}{8}$ x5 $\frac{1}{4}$	32	155.62
RT5	{ 50 MA. 110 V. 30 Cy.	1.0 Amp. 48 V.	1.5 Amp. 10 or 20 V. 60 Cy.	8 $\frac{5}{8}$ x17 $\frac{5}{8}$ x5 $\frac{1}{4}$	35	137.98
RT5-19A	{ 50 MA. 110 V. 30 Cy.	1.0 Amp. 48 V.	1.0 Amp. 48 V. D-C.	¶7x19x6	35	156.80
RT5-19-50	{ 50 MA. 75 V. 25 Cy.	1.0 Amp. 48 V.	1.0 Amp. 48 V. D-C.	¶7x19x6	37	176.40
RT6	{ 20 MA. 110 V. 30 Cy.	0.4 Amp. 21 V.	1.5 Amp. 10 or 20 V. 60 Cy.	8x8 $\frac{7}{8}$ x5 $\frac{1}{4}$	13	74.09
RT7	{ 50 MA. 90 V. 20 Cy.	1.0 Amp. 48 V.	1.5 Amp. 10 or 20 V. 60 Cy.	8 $\frac{5}{8}$ x17 $\frac{5}{8}$ x5 $\frac{1}{4}$	37	167.19
‡ RT7A	{ 50 MA. 90 V. 20 Cy. A-C.	1.0 Amp. 48 V.	1.5 Amp. 10 or 20 V. 60 Cy. A-C.	8 $\frac{5}{8}$ x17 $\frac{5}{8}$ x5 $\frac{1}{4}$	37	183.02
RT9-19A	{ 50 MA. 110 V. 30 Cy.	0.5 Amp. 48 V.	0.5 Amp. 48 V. D-C	3 $\frac{15}{32}$ x19x6	22	125.44

*With common ground, voltage adjustment, 2-prong plug. †With built-in change of source relay. ‡With reverting tone added. §Same as RT7 but includes superimposed ring back tone. ¶In 19-inch RR.

Lorain Dial Tone Generators

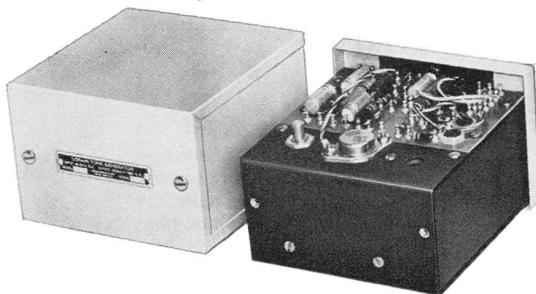
Saturable Core Type Generators are A-C. Operated Devices



Type C

Type	Volts	Cycles	Input MA.	Output Frequency	Output Milli-volts	Price Each
AA	115	60	410	{ 600/120 480	{ 25 150	\$163.66
C	115	60	120	600/120	25	46.84
CK	115	60	120	600/120	25	42.92
D	115	60	170	600/120	100	63.70
DK	115	60	170	600/120	100	58.80
DK50	115	60	170	600/120	100	58.80
E	230	60	335	{ 500/100 480	{ 500 100	205.80
BXCK60	115	60	...	{ 600/120 20	{ 25 *15-20	156.60

Transistor Type Dial Tone Generators are D-C. Operated Devices



Type H1

Type F2 cabinet size is 3½x1¾x5½ inches. All other models measure 4⅞x3⅝x5⅝ inches.

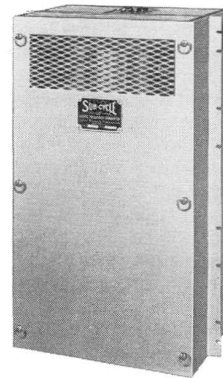
Type	Volts	D-C. INPUT Amperes	OUTPUT Frequency	OUTPUT Milli-watt	Price Each
F1	48/24	0.17	600/120	400	\$111.72
G1	48/24	0.17	500	400	66.64
G2	48/23	0.17	400	400	73.30
G3	48/24	0.17	1200	400	66.64
H1	48/24	0.17	420/40	400	111.72
F2	48	0.1	600/120	25	52.92
F3	48/24	0.17	400/133	400	111.72

Transistor Type 5-watt amplifier with 46-52-volt, 0.3 ampere d-c. input is an accessory for use with Types F1, G1 and H1; specify Type J1, \$52.00 each.

*Watts.

Lorain Multi-Frequency Sub-Cycle Ringing Generators

For Decimonic Ringing Systems



Type K5-19

Type K5 produces ringing voltages of 20, 30, 40, 50 and 60 cycles, which are synchronized to 110-volt, 60-cycle, 1-phase input power without use of moving parts. Since ringing voltages are a smooth sine wave a separate reverting tone circuit is provided. All models are designed for 19 and 23-inch relay rack mounting. Preference of mountings should be specified when ordering.

Type	Description	Ship. Wt., Lbs.	Price Each
K5-19	19x11½x31½ Inches (Single Cabinet); for 19-Inch RR. Mounting; 20-30-40-50 and 60-Cycle Frequencies.....	280	\$798.70
K4-19	The Same as Above, Except with 20-30-40 and 50-Cycle Frequencies.....	270	769.30
K5-23	For 20, 30, 40, 50 and 60-Cycle Frequencies Housed; in a Cabinet 23 Inch Wide, 22¾ Inch high and 12¾ Inch Deep; for mounting on 23 Inch Relay Rack.....	291	798.70
480E	Relay Rack (52 Inches High) for Type K5-23.....	94	41.51

For remote control operation with 50-volt D-C. relay identify with prefix R (RK5-19, RK5-23) and add, \$12.00.

For Synchmonic Ringing Systems

Type S5 utilizes same circuits used in basic Sub-Cycles, to produce ringing voltages of 15, 30, 42, 54 and 66 cycles or 20, 30, 42, 54 and 66 cycles. Output voltages are regulated and are permanently locked in a definite ratio to 60-cycle input power. Input voltage may be either 110 or 220-volt, 1-phase. Since the output voltages are a smooth sine wave, a separate reverting tone circuit is provided. Minimum maintenance, permanently accurate ringing frequencies, closely regulated ringing voltages, no moving or expendable parts. Type S4 Sub-Cycle which generates ringing frequencies of 30, 42, 54 and 66 cycles is available for use where only four ringing frequencies are needed.

All models are designed for relay rack mounting with 19 or 23-inch mounting being optional. Preference of the lowest frequency and mounting should be specified when ordering.

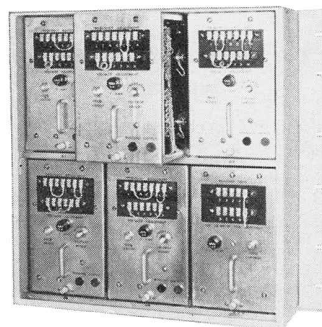
Type	Ship. Wt., Lbs.	Price Each	Type	Ship. Wt., Lbs.	Price Each
S5-20-19	850	\$1501.36	S5-15-23	665	\$1412.18
S5-20-23	647	1501.36	S4-19	850	1322.80
S5-15-19	850	1412.18	S4-23	635	1322.80

For remote control operation with 50-volt D-C. relay identify with prefix R (RS5-20-19) and add, \$26.00.

Prices are subject to change without notice.

Q-17

Lorain Transistor Multi-Frequency Sub-Cycles



Type T25

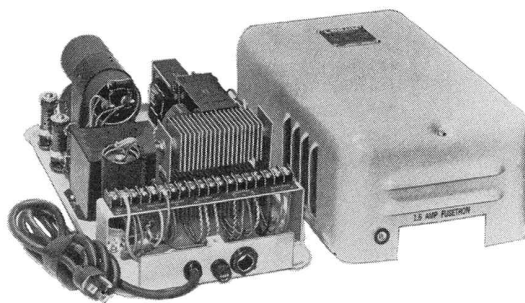
ing two or more Type T50 Sub-Cycles.

Consist of five-plug-in-frequency generators and one-plug-in-common equipment chassis.

Type	Out-put Watts	Frequencies	Approx. Ship. Wt., Lbs.	Price Each
T25	25	All 5 Frequencies as Specified	160	\$1234.80
T50	50	All 5 Frequencies as Specified	225	1734.60
T25	25	Less the Fifth Generator, 4 Frequencies as Specified on Order	144	1048.60
T50	50	Less the Fifth Generator, 4 Frequencies as Specified on Order	200	1468.04

Efficiently produces up to five different ringing frequencies by use of dependable transistor circuits powered by 48-volt central office battery. An individual transistor Sub-Cycle can readily be adjusted to provide a decimonic, a harmonic or a synchronomonic ringing series. Increased ringing power can be obtained by parallel-

Lorain Coin Collect and Return Units



Type T7R

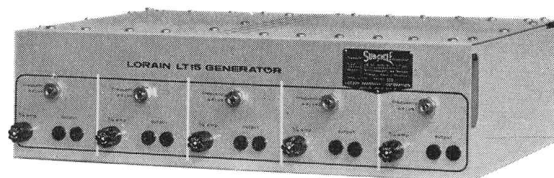
Designed to fulfill usual requirements of pay systems used in telephone industry; ideal permanent replacements for dry cell batteries ordinarily used for this service.

Both polarities are loaded.

Type	INPUT		WATTS		D-C OUTPUT		Price Each
	Volts	Cycles	No Load	Full Load	Volts	Amperes	
T7	111-123	50/60	35	120	120/120	0.25	\$141.12
*T7R	111-123	50/60	35	120	120/120	0.25	152.88
T7T	48	D-C.	†0.2	†1.8	120/120	0.25	192.08
T10	111-123	50/60	10	45	120	0.25	82.32
*T10R	111-123	50/60	10	45	120	0.25	90.16
||T10T	48	D-C.	9	75	120	.5	192.08
TTC	105-125	60	40	170	120	{†0.8 ‡1.2}	113.68

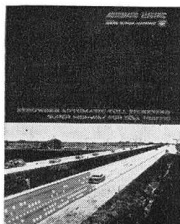
*Circuit includes charge of source relay. †Amperes. ‡Continuous. §Intermittent. ||Transistorized.

Lorain Type LT15 Sub-Cycle Ringing Generators



This transistorized d-c. operated sub-cycle provides sine wave output of 5 or 4 frequencies—harmonic, decimonic or synchronomonic as specified. Frequency changes can be made in the field. The unit is designed to meet the budget of the smallest exchange, is provided with paralleling circuitry for expansion of facilities and occupies 5¼ inches of vertical rack space in a 19-inch relay rack.

Type	Out-put Watts	Frequencies	Approx. Ship. Wt., Lbs.	Price Each
LT15	15	All 5 Frequencies as Specified or 4 Frequencies	50	\$705.60

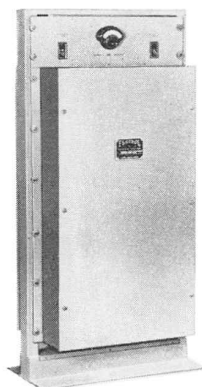


Free SATT Booklet

Explains how you can reduce operating costs with automatic toll ticketing. Shows how a typical SATT system processes toll calls.

For your free booklet, write Automatic Electric Sales Corporation, Northlake, Illinois.

Lorain Flotrol Single Phase Rectifiers



Constant Voltage—Fully Automatic Without Moving Parts

Two types are available (a) "leakage reactance" and (b) magnetic-amplifier.

Leakage reactance type (also called "tuned models") Flotrols are characterized by (1) simple rugged design, (2) fast response, (3) low output ripple voltage and (4) high power factor. Magnetic-amplifier type Flotrols (also called "quiet models")—(1) have higher overall efficiency, (2) less audible noise, (3) are frequency compensated, (4) output voltage is more readily adjusted.

All single phase Flotrols (unless specified otherwise) have output voltage regulation of plus or minus 1 per cent from 10 per cent load to full load with plus or minus 8½ per cent line voltage variations. They are all equipped with input and output protection and have inherent overload protection. Ordinarily they have output filtering and a normal-equalize switch. Unless ordered special, they are for 60-cycle operation only.

Usually single phase Flotrols are equipped with ammeter only. A voltmeter can be substituted for the ammeter at no charge or added as an optional feature.

Paralleling provisions, remote control relays, ground indicating lamps and charge failure alarms can be added as optional features to single phase Flotrols. Most single phase Flotrols can be ordered as battery eliminators.

24-Volt Flotrol Rectifiers

Type	Input Volts	OUTPUT		Mounting	Ship. Wt. Lbs.	Price Each
		Into Cells	Amperes			
U24A	115	10, 11, 12	1.0	19" RR or W	25	\$169.15
U75A	115	10, 11, 12	3.0	||	78	\$264.01
U150A	115	10, 11, 12	6.0	||	117	\$301.64
U150AF	115	9, 10, 11	6.0	||	117	\$321.05
U300A	115	10, 11, 12	12.0	||	185	\$517.83
300AA	115	8	12.0	||	190	\$517.83
U300AF	115	9, 10, 11	12.0	||	189	\$517.83
U600A	230	11, 12	24.0	23" RR	350	\$869.46
U600A1	115	11, 12	24.0	23" RR	353	\$869.46
U600AF1	115	9, 10, 11	24.0	23" RR	353	\$958.05

Dual Range Flotrol Rectifiers

U150D	115	11, 12	6.0	||	119	\$317.91
	230	22, 23, 24	3.0			
U300D	115	11, 12	12.0	||	187	\$540.18
	230	22, 23, 24	6.0			

48-Volt Flotrol Rectifiers

U75B	115	22, 23, 24	1.5	||	78	\$264.01
U150B	115	22, 23, 24	3.0	||	118	\$301.64
U300B	115	22, 23, 24	6.0	||	182	\$494.70
300BA	115	20	6.0	||	185	\$517.83
U600B	230	23, 24, 25	12.0	23" RR	345	\$840.84
U600B1	115	23, 24, 25	12.0	23" RR	345	\$840.84
600BA1	115	20, 23, 24	12.0	23" RR	345	\$905.13
¶UE600B	230	23, 24, 25	12.0	23" RR	365	\$978.04
U1200B	230	23, 24, 25	24.0	23" RR	423	\$1331.82
1200BA	230	20, 23, 24	24.0	23" RR	423	\$1405.52
U1200B1	115	23, 24, 25	24.0	23" RR	423	\$1331.82
¶UE1200B	230	23, 24, 25	24.0	23" RR	443	\$1470.00

130 and 140-Volt Flotrol Rectifiers

U350J	230	66	2.5	||	187	\$611.52
U400H	115/230	57, 60, 63	3.0	||	193	\$644.06
700H	230	57, 60, 63	5.0	Floor	398	\$1009.01
U700J	230	66	5.0	23" RR	335	\$1009.01
1400H	230	57, 60, 63	10.0	Floor	410	\$1586.82
U1400J	230	66	10.0	23" RR	423	\$1586.82
3302H	230	57, 60, 63	25.0	Floor	600	\$2234.40

¶Wall mounting is standard for these models, but when specified on order, they can be arranged for 19-inch, 23-inch or 30-inch relay rack mounting at no extra charge.

¶Equipped with d-c. remote control relay, voltmeter, ammeter and end-

Flotrol Rectifiers for Emergency Cells and Special Flotrol Rectifiers with $\pm 2\frac{1}{2}\%$ Voltage Regulation

Type	Input Volts	OUTPUT		Mounting	Ship. Wt. Lbs.	Price Each
		Cells	Volts Amperes			
DU42EBN2	230	1 or 2	2.17/4.34	10	23" RR	50 \$380.24
221EA2	210/230	{1 or 2 1 or 2}	4.3/8.68	25	19" RR	210 591.14
D12EB2	230	2	4.34	3	19" RR	30 258.72
20EB2	230	2	4.34	5	19" RR	39 264.60
D42EB2	230	2	4.34	10	19" RR	71 290.08
440EA2	230	2 & 2	8.68	50	19" RR	245 1207.35
DU160E	230	3	6.5	25	23" RR	114 323.40
24E	115	3	6.5	4	19" RR or W	35 174.24
130E	115	3	6.5	20	19" RR or W	124 301.64
24EA	115	4	8.6	3	19" RR or W	25 174.24
24EA2	230	4	8.6	3	19" RR or W	25 174.24
U40MA2	230	6	13.0	3	19" RR or W	68 203.84
40MA3	115/230	6	13.0	10	19" RR or W	68 224.22
140MA3	115/230	6	13.0	10	19" RR or W	117 306.74
280MA3	115/230	6	13.0	20	19" RR or W	185 517.83
U15AA	115	8.9	24.0	0.75	Wall	16 73.30
15MA	115	6	13.0	1	Wall	21 103.88
U105F	230	16	36.0	3	19" RR or W	83 375.14

All models above may be adapted to a wider relay rack than indicated when specified.

Quiet Model Flotrol Rectifiers

Type	Input Volts	OUTPUT		Mounting	Ship. Wt. Lbs.	Price Each
		Into Cells	Amperes			
72A	115	9, 10, 11, 12	3	||	104	\$313.99
152A	115	9, 10, 11, 12	6	||	112	\$379.06
302A	115	9, 10, 11, 12	12	||	188	\$611.52
112BA	115	17, 18	3	||	106	\$356.72
222BA	115	17, 18	6	||	120	\$415.91
154B	115	23, 24	3	||	114	\$354.76
452B	115	23, 24	9	||	132	\$519.40
452B2	230	23, 24	9	||	132	\$533.12
D602B1	115	23, 24	12	**	230	\$811.44
1202B1	115	23, 24, 25	24	23" RR	540	\$1331.82
1202B	230	23, 24, 25	24	23" RR	540	\$1331.82
2402B1	115	23, 24, 25	50	Floor	700	\$1909.00
2402B	230	23, 24, 25	50	Floor	600	\$1909.00

cell switch to float 26-cell battery. Includes no-charge alarm relay 24K and paralleling terminal.

**Arranged for 23-inch or 30-inch relay rack mounting at no extra cost; specify which mounting is required.

Prices are subject to change without notice.

Q-19

Lorain Flotrol Single Phase Silicon Rectifiers

Silicon Diodes-Transistor Reference

50-Volt Flotrol Chargers

A charge failure alarm is available as an accessory on all models.

Type	Input Volts	OUTPUT		Mount- ing	Ship. Wt. Lbs.	Price Each
		Into Cells	Amps.			
*F12A50	115	23, 24, 25	12	19" RR	141	\$793.80
*F12B50	230	23, 24, 25	12	19" RR	141	793.80
*F18A50	115	23, 24, 25	18	19" RR	193	907.48
*F18B50	230	23, 24, 25	18	19" RR	193	907.48
†‡§ F30A50	115	23, 24, 25	30	23" RR	298	1397.48
†‡§ F30B50	230	23, 24, 25	30	23" RR	298	1397.48
†‡§ F50A50	115	23, 24, 25	50	23" RR	482	1909.04
†‡§ F50B50	230	23, 24, 25	50	23" RR	482	1909.04

50-Volt Flotrol Eliminator-Chargers

A charge failure alarm is available as an accessory on all models.

Type	Input Volts	OUTPUT		Ripple in MV	Mounting	Ship. Wt. Lbs.	Price Each
		Volts	Amps.				
*H12A50	115	50	12	30	19" RR	141	\$823.20
*H18A50	115	50	18	30	19" RR	193	966.28
*‡H30G50	115	50	30	30	23" RR	321	1708.14

130-Volt Flotrol Eliminators

Type	Input Volts	OUTPUT		Ripple in MV	Mounting	Ship. Wt. Lbs.	Price Each
		Volts	Amps.				
G2F130	115/230	130	2	30	19" RR	82	\$578.20
G5F130	115/230	130	5	30	19" RR	110	833.00

140-Volt Portable Flotrol Chargers

Type	Input Volts	—OUTPUT—		Mount- ing	Ship. Wt. Lbs.	Price Each
		Into Cells	Amps.			
PF5A140	115	60-66	5	Portable	115	\$833.96

Type J Flotrol Chargers

Designed especially for microwave applications. They incorporate silicon diodes and a transistor reference.

The following accessories are available: charge failure alarm relay, remote control relay, 30 MV filtering and equalize timer.

Type	Input Volts	OUTPUT		Ripple in MV	Mounting	Ship. Wt. Lbs.	Price Each
		Into Cells	Amps.				
J100B25	210/240	11, 12	100	100	23" RR	362	\$1313.20
J50B50	210/240	23, 24, 25	50	100	23" RR	437	1323.00

*Remote control relay available as an accessory.

†End cell switch standard.

‡A floor mounting stand is available as an accessory.

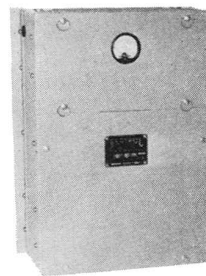
§Remote control relay standard.

||50 cycles per second input.

Q-20

Lorain Battery Eliminators

Plus or Minus 2 Per Cent Regulation



Type	Input Volts	OUTPUT		Ripple in MV	Mounting	Ship. Wt. Lbs.	Price Each
		Volts	Amps.				
BE75A	115	24	3	30	||	85	\$285.38
BE150A	115	24	6	30	||	123	324.18
BE150AF	115	23	6	30	||	123	343.39
BE300A	115	24	12	30	||	201	539.20
BE300AF	115	23	12	30	||	201	539.20
BE600A	115	24	24	30	23" RR	353	901.99
BE150B	115	48	3	30	||	123	324.18
BE300B	115	48	6	30	||	190	539.20
BE600B	230	48	12	30	23" RR	348	901.99
BE600B1	115	48	12	30	23" RR	348	901.99

Quiet Model

BE72A	115	24	3	..	||	107	\$344.57
BE112BA	115	24	6	..	||	110	356.72
BE152A	115	24	6	..	||	114	409.64
BE154B	115	48	3	..	||	117	385.34

Plus or Minus 5 Per Cent Regulation

TTC	115	120	0.8	200	Shelf	43	\$113.68
TTD	115	90	0.8	200	Shelf	43	141.12
TT2A	115	48/55	2	200	19" RR	34	176.40
T192B	115	48	4	200	19" RR	68	227.36
T292B	115	48	4	100	23"RRorW	89	431.20
BE192B	115	48	4	30	19" RR	80	270.48
BED302BCR	115	48	6	30	||	123	456.88
BED452BR	115	48	9	30	||	132	499.80

Lorain Flotrol Supplementary Chargers

An unregulated, constant current power supply used in connection with a constant voltage Flotrol to obtain increased charging current at low cost while maintaining closely regulated voltage characteristics of constant voltage Flotrol. Rating of supplementary charger can not exceed that of constant voltage Flotrol. A control relay actuated by output current of constant voltage Flotrol turns supplementary charger on and off as needed.

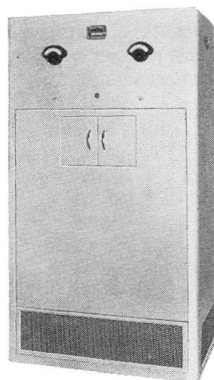
Type	Input Volts	OUTPUT		Ship. Wt., Lbs.	Price Each
		Volts	Ampere		
150SB	115/230	45-56	3	79	\$203.84
300SB	115/230	45-56	6	144	307.72
600SB	115/230	45-56	12	248	470.40
1200SBX	115/230	45-56	24	330	744.80
150SA	115/230	25	6	79	206.98
300SA	115/230	25	12	144	347.12
600SAX	115/230	25	24	248	521.75

||Wall mounting is standard for these models, but when specified on order, they can be arranged for 19-inch, 23-inch or 30-inch relay rack mounting at no extra charge.

Prices are subject to change without notice.

Lorain Flotrol Three Phase Rectifiers

Constant Voltage—Fully Automatic Without Moving Parts



Magnetic-amplifier type voltage control and output voltage regulation of plus or minus 1 per cent from 2 per cent load to full load with input voltage variations of plus or minus 8 per cent. The 220-volt Flotrols have taps for operation on a 208-volt or 230-volt input while 440-volt Flotrols have taps for operation on a 420 or 460-volt source. All standard models are equipped with voltmeter, ammeter, paralleling features, input and output protection, inherent overload and have provisions for output voltage adjustment including a normal-equalize switch. All 24 and 48-volt models are equipped with a d-c. remote control relay. This feature is optional on other models. Flotrols ordinarily have d-c. output filtering. Unfiltered units are available and are identified by an N suffix. Can be factory modified to become battery eliminators.

Charge failure alarms are available for all models.

24-Volt Flotrol Rectifiers

Type	Input Volts	AMPERES		Ship. Wt. Lbs.	Price Each
		Input	Output		
†U1250A	230	8.0	50	430	\$1519.98
U2500A	230	12.5	100	650	2285.36
U5KA	230	24.0	200	1380	3292.80
20KA	230	96.0	800	2200	6920.76

48-Volt Flotrol Rectifiers

†U1250B	230	6.7	25	430	\$1448.83
†U2501B	230	12.5	50	495	1821.82
U2500B	230	12.5	50	675	1972.74
U3750B	230	18.0	75	725	2608.76
U5KB	230	23.0	100	1380	3093.86
U7.5KB	230	35.0	150	1550	3729.88
U10KB	230	48.0	200	1900	4678.52
10KB4	460	24.0	200	1900	4678.52
U20KB	230	90.0	400	2200	6446.44

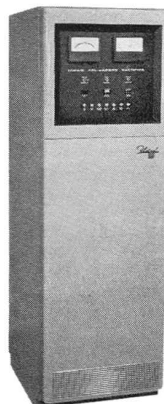
130-Volt Flotrol Rectifiers

2100H	230	9.0	15	650	\$1811.04
3300H	230	16.0	25	650	2285.36
4600H	230	21.0	35	1000	2824.36
6.5KH	230	30.0	50	1500	3557.40
6.5KH4	460	15.0	50	1500	3557.40

†For floor mounting use 23-inch relay rack, 52 inches high, Type 119E, shipping weight, 80 pounds.

Lorain Flotrol Three Phase Silicon Rectifiers

Silicon Diodes-Transistor Reference



Provided with conservatively rated, reliable silicon diodes. Transistor control gives regulation of $\pm 1/2\%$ from no load to full load with input variations of $\pm 10\%$ and ± 3 cycles. The 230-volt Flotrol Rectifiers have taps for operation on 210, 230, or 250-volts while the 440-volt models have 440, 460 and 480-volt taps. All standard models are equipped with voltmeter, ammeter, paralleling features, input and output protection, inherent overload protection and have provisions for output voltage adjustment including a normal-equalize switch. All models are equipped with a d-c. remote control relay.

Charge failure alarms are available for all models as an accessory.

25-Volt Flotrol Chargers

Type	Input Volts	AMPERES		Ship. Wt. Lbs.	Price Each
		Input	Output		
*F200D25	230	21.6	200	558	\$2979.20
*F400D25	230	38	400	1327	4449.20

50-Volt Flotrol Chargers

An end cell switch is standard on all models.

Type	Input Volts	AMPERES		Mounting	Ship. Wt. Lbs.	Price Each
		Input	Output			
†F50D50	230	10.6	50	23" RR	355	\$1811.04
†F100D50	230	20.3	100	23" RR	528	2822.40
F200D50	230	42.4	200	Floor	1327	4214.00
†F200K50	230	48	200	Floor	1498	5267.50
F400D50	230	77	400	Floor	1662	5684.00
\$F800D50	230	138	800	Floor	3100	10019.52

140-Volt Flotrol Chargers

A floor mounting stand is available as an accessory on these models.

Type	Input Volts	AMPERES		Mounting	Ship. Wt. Lbs.	Price Each
		Input	Output			
F15D140	230	8.25	15	23" RR	355	\$1734.60
F25D140	230	13.6	25	23" RR	398	2195.20
F50D140	230	25.7	50	23" RR	550	3155.60

*An end cell switch is available as an accessory.

†A floor mounting stand is available as an accessory.

‡50 cycles per second input.

§Also available for 440-volt input.

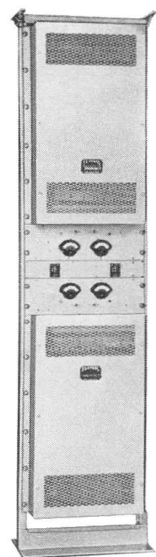
Prices are subject to change without notice.

Lorain YZ Dual Flotrol Assemblies

Maximum Charging Capacity
Minimum Floor Space

Comprised of two complete Flotrol chargers (single phase or three phase) mounted one above the other in a standard 23-inch relay rack. May be operated individually or in parallel with each other. Either stand-by capacity or additional operating capacity can be accomplished without extra floor space.

An automatic control panel is available as an optional feature. With this panel Flotrols can be operated, not only individually or continuously with each other, but alternately, with one Flotrol as primary charger and other automatically turning off or on as load requires.



Type
Y2501B-C-Z1250B

YZ Dual Combination Single Phase
Flotrols

230-Volt, 60-Cycle Input

Type	Volts	D-C. OUTPUT Total Amps.	Price per Assembly
Y600B-C-Z600B	50	24	\$1999.40
Y600B-Z600B	50	24	1906.49
Y1200B-C-Z600B	50	36	2500.18
Y1200B-Z600B	50	36	2407.27
Y1200B-C-Z1200B	50	48	3000.96
Y1200B-Z1200B	50	48	2908.05

YZ Dual Combination Three Phase
Flotrols

230-Volt, 60-Cycle Input

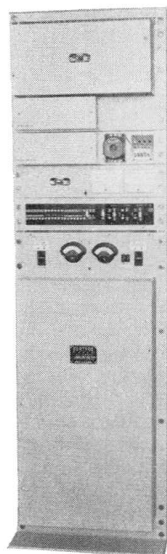
Y1250A-C-Z1250A	25	100	\$3292.02
Y1250A-Z1250A	25	100	3189.90
Y1250B-C-U1250B	50	50	3140.51
Y1250B-U1250B	50	50	3047.60
Y2501B-C-U1250B	50	75	3513.50
Y2501B-U1250B	50	75	3420.59
Y2501B-C-U2501B	50	100	3886.48
Y2501B-U2501B	50	100	3793.58

Lorain Flotrol 130-Volt Power Panels

Provides a regulated output voltage for plate current supply with capacities to 50 amperes. Automatically regulates the load voltage between 125 and 135 volts when used with a 66-cell lead acid battery.

Panels up to and including 20-ampere capacities include a Flotrol, constant voltage charger which maintains the 66-cell battery at the proper floating voltage when operating within its range.

Panel Designations	Use
PJR—with Resistors	Constant Loads
PJD—with Dry CEMF Cells	Varying Loads
PJC—for Wet CEMF Cells	Varying Loads



Type PJ20DB

With Built-In Resistors

Type	AMPERES Min. Max.	Ship. Wt. Lbs.	Price Each
PJ2.5RB	0.7 2.5	240	\$1240.68
PJ5RB	0.8 5.0	260	1259.30
PJ10RB	0.9 10.0	300	1309.28
PJ20RB	0.9 20.0	370	1409.24
*PJ50RB	2.7 50.0	425	1822.80

With Built-In Dry CEMF Cells

PJ2.5DB	...	2.5	240	\$1219.12
PJ5DB	...	5.0	260	1270.08
PJ10DB	...	10.0	310	1407.28
PJ20DB	...	20.0	380	1600.34
*PJ50DB	...	50.0	425	2097.20

For Use with Wet CEMF Cells

PJ2.5CB	...	2.5	220	\$1151.50
PJ5CB	...	5.0	235	1171.10
PJ10CB	...	10.0	275	1211.28
PJ20CB	...	20.0	340	1286.74
*PJ50CB	...	50.0	380	1421.00

Models listed above require 50-volt d-c. for operating their relays; 24-volt relays can be supplied on a special order by dropping last letter (B) and replacing with letter (A); 130-volt control can be had by replacing last letter with a letter (J).

Lorain Flotrol 66-Cell Chargers

For Use with Above Panels

Single Phase 60-Cycle Input

Type	Input Volts	Output Amperes	Size Inches	Ship. Wt. Lbs.	Price Each
†350J	230	2.5	19x12x28	187	\$611.52
700J	230	5	23x15x45½	335	1009.01
1400J	230	10	23x15x45½	423	1586.82

Three Phase 60-Cycle Input

2100J	230	15	23x15x45½	650	\$1811.04
3500J	230	25	32x19x60	685	2328.48
5KJ	230	35	32x19x60	825	2889.04
7KJ	230	50	36x26x72	1500	3643.64

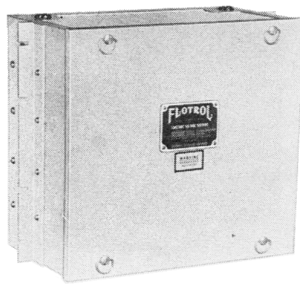
*Charger must be mounted externally. †Requires one pair of 126E adapter plates for rack mounting.

APPLIES TO SINGLE PHASE COMBINATIONS ONLY. "1" after suffix B indicates models operating from 115 v., 60-cy. a-c. input. "E" after Y or Z indicates models have voltmeters as well as ammeters a 23-26 cell switch and no-charge alarm relay 24K. "X" after above Type indicates models without provisions for load sharing connection or remote control relay. These models are not available with automatic control panels, but mount in 91-inch vertical rack space.

APPLICABLE TO BOTH SINGLE PHASE OR THREE PHASE COMBINATIONS. In above assemblies model with prefix "Y" is upper, inverted unit and that with prefix "Z" is lower unit. "C" between models indicates with automatic control panel. Any above models are available separately as a single unit. Output capacity of one Flotrol is one-half total amperes indicated for assembly of which it is a part. Relay rack 510E (8'8") standard on combinations. Relay rack 697E (9'0") available when specified.

Lorain Carrier Supply Units

Flotrol Type



Type CS1

Provides for carrier or repeater operation, 130-volt, 0.5 or 1.5 ampere plate current.

Units listed below operate from a-c. power line and upon line power interruption, automatically transfer to a built-in line vibrator which operates from central office battery. Each unit equipped with a spare vibrator.

Type	A-C. INPUT Volts	INPUT Amperes	D-C. INPUT Volts	INPUT Amperes	Output Amperes	Price Each
CS1	100-130	1.0	45-52	2.5	0.5	\$398.47
CS2	100-130	1.0	22-25	5.0	0.5	406.90
CS12	190-250	0.5	45-52	2.5	0.5	398.47
*CS1A	100-130	1.0	45-52	2.5	0.5	436.30
*CS2A	100-130	1.0	22-25	5.0	0.5	442.57
*CS12A	190-250	0.5	45-52	2.5	0.5	436.30
*CS22A	190-250	0.5	22-25	5.0	0.5	444.53
†CS1BC	100-130	1.0	44-50	2.5	0.5	545.27
†CS2BC	100-130	1.0	22-25	5.0	0.5	553.70
†CS3	100-130	3.4	44-52	7.8	1.5	960.40
†CS3D	100-130	3.4	44-52	7.8	1.5	995.68
†CS3E	100-130	3.4	44-52	7.8	1.5	999.60
†CS3F	100-130	3.4	44-52	7.8	1.5	1019.20

Transistor Type

These units utilize transistorized circuits and are designed for extended trouble-free and maintenance-free service. They do not employ vibrators and do not rely on line power since they operate from office batteries.

Type	Input D-C. Volts	D-C. OUTPUT Volts	Amperes	Price Each
CST1	48	130	2.0	\$548.80
CST2	48	130	0.15	179.34
CST3	48	130	5.0	707.56
CST5	48	130	5.0	862.40

*Equipped with alarm features in form of red, green and white lamps. †Equipped with special features (extra capacitors, marginal transfer relay, time delay relay and provision for a remote output failure alarm). ‡Equipped with six special features listed in LPC's bulletin 170B. §Use three units for 6-12-18-volt assembly. ||Available for 19 or 23-inch relay rack mounting; indicate by -19 or -23, as Type suffix.

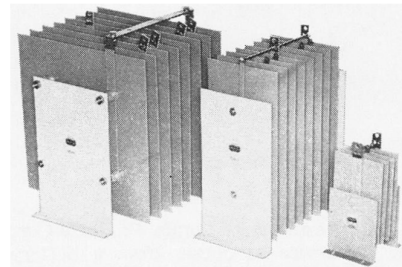
Prices are subject to change without notice.

Lorain Dry CEMF Cells

Used as voltage regulating elements. They are maintenance free and are adapted for mounting in a variety of positions.

"V" CEMF Cell Assemblies

For wall, shelf or battery rack mounting, equipped with mounting brackets.



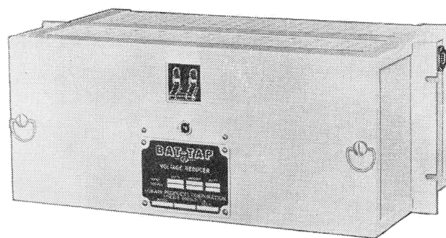
Type	WCA4V2	Type	TCA4V2	Type	LCA4V1	Price Each
Type	—RATING— Amps. Volts	Price Each	Type	—RATING— Amps. Volts	Price Each	
LCA4V1	5 2	\$10.80	WCA4V3	100 2	2	\$140.14
PCA4V1	8 2	16.00	VCA4V4	100 2	2	152.88
QCA4V1	10 2	18.00	XCA4V3	125 2	2	194.04
LCA4V2	10 2	21.40	WCA4V4	125 2	2	181.30
TCA4V1	15 2	29.00	XCA4V4	150 2	2	248.92
PCA4V2	15 2	29.00	XCA4V5	200 2	2	303.80
LCA4V3	15 2	30.00	JCC12V1	2.5 6-12-18	54.88	
WCA4V1	30 2	52.00	LCC12V1	5 6-12-18	80.36	
TCA4V2	30 2	56.00	QCC12V1	10 6-12-18	186.20	
VCA4V2	50 2	85.60	TCC12V1	15 6-12-18	209.72	
WCA4V2	60 2	98.80	UCC12V1	20 6-12-18	276.36	
UCA4V3	60 2	100.60	§WCA12V1	30 6	140.14	

"R" CEMF Cell Assemblies

For relay rack mounting.

Type	—RATING— Amperes	Volts	Inch Space in R. R.	Price Each
LCA4R1	5	2	5¼	\$15.29
PCA4R1	8	2	7	21.17
QCA4R1	10	2	7	23.13
LCA4R2	10	2	5¼	25.87
TCA4R1	15	2	7	37.24
PCA4R2	15	2	7	34.10
LCA4R3	15	2	5¼	34.30
WCA4R1	30	2	14	60.96
TCA4R2	30	2	7	63.50
VCA4R2	50	2	12¼	93.10
WCA4R2	60	2	14	106.62
UCA4R3	60	2	10½	108.00
WCA4R3	100	2	14	149.94
VCA4R4-23	100	2	12¼	162.29
XCA4R3-23	125	2	14	203.84
WCA4R4-23	125	2	14	192.08
XCA4R4-23	150	2	14	258.72
JCC12R1	2.5	6-12-18	3½	58.60
LCC12R1	5	6-12-18	5¼	84.67
QCC12R1-23	10	6-12-18	7	192.08
TCC12R1-23	15	6-12-18	7	219.52
UCC12R1-23	20	6-12-18	10½	286.16
§WCA12R1	30	6	14	149.94

Lorain Bat-Tap Voltage Reducers and Transfer Assemblies



Type QB15A2

The Bat-Tap is exclusively Lorain Products Corporation's trade name for device to obtain from a battery a lower d-c. voltage without use of voltage dropping resistors or CEMF cells and accompanying loss of power. Positive lead of a Bat-Tap is common to both input and output circuits. All equipment listed below is for mounting in a 19-inch relay rack and with adapters for other relay racks.

Type	Input Volts	OUTPUT Volts	Amperes	Price Each
QB15A	48	24	15	\$344.96
*QB15A2	48	24	15	378.28
†QB15A3	48	24	15	401.80
‡QB15A4	48	24	15	378.87
QB15AB	48	20	15	384.16
||QB15ABN	48	20	15	384.16
\$QM7A	11	24	7	348.68
QA7B	24	52	7	344.96
QB15A7	48	24	15	391.61
†QB15A8	48	24	15	413.56

*Includes protective output diode for paralleling and output failure alarm relay and lamp.

†Same as QB15A2 but with ammeter.

‡Same as QB15A but with amp. failure alarm relay and lamp.

\$Optional internal connection for 11 or 13-volts d-c. input.

||48-volt input, reverse polarity.

†Same as QB15A7 but with ammeter.

Lorain Test Load Units



Type Y1

Used to simulate a predetermined operating load for equipment testing and adjusting purposes. Virtually any practical load up to 7,500 watts (at 25, 50 and 130 volts) may be produced to meet testing and adjustment conditions.

Type	RATING Amperes	Volts	Dimensions Inches	Ship. Wt. Lbs.	Price Each
Y1	{ 150 300 }	{ 50 25 }	14 1/8 x 14 1/8 x 16	55	\$380.24
Y2	{ 65 100 }	{ 130 50 }	14 1/8 x 14 1/8 x 16	55	427.28
Y2	{ 50 100 65 }	{ 25 50 130 }	Spec. 835-04	75	433.16

Lorain Howlers



Serves as the ideal method of getting a misplaced receiver on the hook without making a service call. The signal tone produced by the Lorain Howler is distinctive, attention demanding and yet safe.

Cat. No.	Model No.	Dimensions Inches	Ship. Wt. Lbs.	Price Each
S-4879	B	8x8 7/8x6 1/2	10	\$152.88

Assembly No.	Assemblies Description	Price Each
927-11	Assembly of Two QB15AB both Operating Continuously and 206K Transfer Panel Used Only with Bat-Taps having Built-In Circuit Breakers.....	\$958.44

Lorain D-C. to D-C. Converters

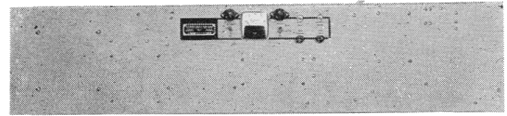
Have output circuits isolated from the input circuits.

Type	Input Volts	OUTPUT Volts	Amperes	Price Each	Type	Input Volts	OUTPUT Volts	Amperes	Price Each
RB1G19	48	65	1	\$231.28	RH5H19	130	130	5	\$ 744.80
RB2B19	48	48	2	264.60	RH10H23	130	130	10	1666.00
RB2G19	48	48/65	2	241.08	RJASH19	152	130	5	793.80
RB20M19	48	10, 11, 12, 13, 14	20	426.50	RJA15A19	152	24	15	644.84
RB5A19	48	24	5	286.16	**SB5M19	48	12	5	316.54
RH15A19	130	24	15	533.12	††SB5MB19	48	10	5	316.54
RH10B19	130	48	10	744.80	††SB25AA	48	18	25	772.24

**±1% regulation from no load to full load. ††±2% regulation from no load to full load. ††±3% regulation from no load to full load.

Lorain Ringing and Talking Supply Units

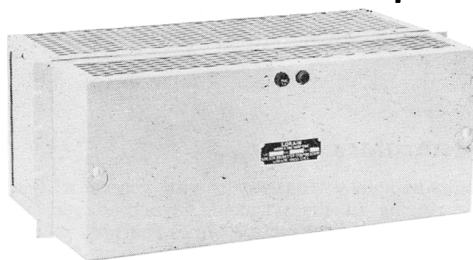
These units, designed to operate from a 115-volt, 60-cycle a.c. source, are compact, reliable, combination power supply units adapted for use with branch exchanges to supply talking power and ringing power. Most units also include a low tone output and some of the units also supply 60-cycle signaling voltage.



Type	Input Volts A.C.	Talking D.C. Volts/ Amps.	Signalling 60-Cycle Volts/ Amps.	Ringing Cycles/ Watts	Tone 600/120 Cycles/ Milliwatts	Remarks	Price Each
3B1	115	50/3	10/2	20/7.5	25	Battery Eliminator. Unit Includes Interrupter. Twelve Signalling, Fused Circuits with Isolated Failure Alarm.	\$754.60
6A1	115	24/6	10/15, 20/1	20/7.5	..	For Use with or without Battery.	439.00
6B2	115	50/6	....	20/7.5	25	For Use without Battery. Adaptable to Use as Charger.	485.30
6B3	115	50/6	....	20/7.5	25	For Use with or without Battery.	531.94
6B4	115	50/6	....	20/7.5	25	Transistor Tone and Ringing.	550.76
6B5	115	50/6	....	20/7.5	25	For Use without Battery.	452.76
6B6	115	50/6	....	20/7.5	25	Transistor Tone and Ringing. Standard—Charger. Optional—Battery Eliminator.	579.38
9B2	115	50/9	....	30/5	25	Battery Eliminator.	530.85
9B3	115	50/9	....	20/7.5	25	Battery Eliminator.	572.32
9B4	115	50/9	....	20/7.5	25	Battery Eliminator.	572.32
9B5	115/50	50/9	....	25/5	25 (500/100)	Same as 9B2 but for 50-Cy. Input.	664.44
*9B6	115	50/9	10/4	20/15	100	Battery Eliminator.	827.12
12A1	115	24/12	10/30, 20/20	20/7.5	..	Battery Eliminator.	485.30
12B1	115	50/12	....	20/7.5	25	For Use with or without Battery. Transistor Tone and Ringing.	733.04

*Includes an interrupter.

Lorain Combined Interrupter and Ringing Tone Power Supply for PBX Systems



Compact unit for 23-inch relay rack mounting. Provides reliable, trouble-free service and includes transistorized circuits independently card mounted for plug-in mounting. Mounted in a cabinet 23x8 $\frac{3}{4}$ x12 in.

Type	Ship. Wt., Lbs.	Price Each
NRT1	75	\$736.96
NRT2	94	691.88
NRT3	94	751.66
NRT4	94	590.94

Output Characteristics

Function—Busy Tone

Type	Frequency	Interruption Pattern	Voltage	Remarks
NRT1	600/120 CPS.	60 IPM.; $\frac{1}{2}$ Sec. On; $\frac{1}{2}$ Sec. Off	1.0	One Output Direct to Ground. One Output to Ground through Capacitor.
NRT3	600/120 CPS.	60 IPM.; $\frac{1}{2}$ Sec. On; $\frac{1}{2}$ Sec. Off	1.0	
NRT4	600/120 CPS.	60 IPM.; $\frac{1}{2}$ Sec. On; $\frac{1}{2}$ Sec. Off	1.0	

Function—Dial Tone

NRT1	600/120 CPS.; 25 MW.	Uninterrupted	1.0	Single Output
NRT3	600/120 CPS.; 25 MW.	Uninterrupted	1.0	
NRT4	600/120 CPS.; 25 MW.	Uninterrupted	1.0	

Function—All Trunks Busy Tone

NRT1	600/120 CPS.	120 IPM.; $\frac{1}{4}$ Sec. On; $\frac{1}{4}$ Sec. Off	3.0	Single Output
NRT3	600/120 CPS.	120 IPM.; $\frac{1}{4}$ Sec. On; $\frac{1}{4}$ Sec. Off	3.0	

Function—Interrupted Ringing

NRT1	{20 CPS. with 400/40 Superimposed Ring- Back}	1 Sec. On; 3 Sec. Off	90 or 105	{Two Outputs. Each from One of Two Isolated Windings on the Ringing Transformer.
NRT3		3 Sec. On; 4 Sec. Off	90 or 105	

Function—Continuous Ring

NRT1	{20 CPS. with 420/40 Superimposed Ring- Back}	.....	90 or 105	Single Output
NRT3		.....	90 or 105	Single Output
NRT4		.....	90 or 105	Two Outputs

Function—Ground Pulse Output

NRT1		60 IPM.; $\frac{1}{2}$ Sec. On; $\frac{1}{2}$ Sec. Off		Single Output, 1 Ampere Max. Capacity.
NRT3	.....	60 IPM.; $\frac{1}{2}$ Sec. On; $\frac{1}{2}$ Sec. Off	.....	
NRT4	.....	{Ground Pulse Gate for Operating Ex- ternal Ringing Relay at 1 Sec. On; 3 Sec. Off.	.....	
NRT4	.....	.....	.....	

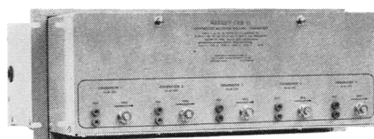
Function—Ground Pulse Output

NRT1		120 IPM.; $\frac{1}{4}$ Sec. On; $\frac{1}{4}$ Sec. Off		Single Output, 1 Ampere Max. Capacity.
NRT3		120 IPM.; $\frac{1}{4}$ Sec. On; $\frac{1}{4}$ Sec. Off		

Prices are subject to change without notice.

Q-25

Warren Controlled-Rectifier Sinewave Ringing Generators



Battery-powered, multi-frequency ringing generators which employ silicon-controlled-rectifier output circuits

for utmost reliability. Small and compact, yet with every component completely accessible, this modern ringing generator cannot be harmed by overloads, shorts, or d-c or a-c potentials or surges up to 100 volts.

A Start-Stop relay is always included. Current boosters for any one or all frequencies are available. For example, a 5CRR15 plus two 1CRB15's provides 15 watts at four frequencies and 45 watts output on the remaining frequency. A 5CRR15 plus a 5CRS15 provides 30 watts output on all five frequencies. In this fashion, the power output of a basic ringer can be multiplied economically at any time without purchasing a second ringing generator. Boosters with the designator CRB may be cascaded in any number. The single-frequency 1CRS15 is used to double the output at one frequency.

To order Warren Controlled Rectifier Ringing Generators, Slave or Booster Units, specify by Type No. developed as follows:

1. Number of frequencies: 5, 4 or 1.

2. Series designator:

CRR for ringer.

CRS for slave.

CRB for cascable booster.

EXAMPLE: A Warren 15-Watt Controlled Rectifier Ringing Generator for synchrononic ringing to mount on a 19-inch rack would have the Type No.:

5CRR-15S-19-16, 30, 42, 54, 66

In specifying frequencies of the generators, a standard CRR-15 can be adjusted within the ranges listed below:

Generator 1..... 16 to 20 cps.

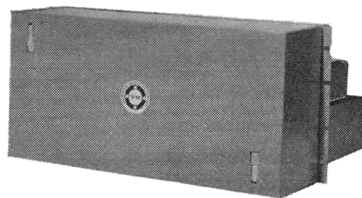
Generator 2..... 25 to 30 cps.

Generator 3..... 33 to 42 cps.

Generator 4..... 50 to 54 cps.

Generator 5..... 60 to 67 cps.

Warren Transistor Ringing Generators



Type TMR. A battery-powered, multi-frequency transistor ringing generator. Provides stable, continuous, on-frequency ringing in the harmonic, synchrononic, and decimonic series for up to 4000 lines (25-watt models) or 8000 lines (50-watt models) in any 5-frequency combination. Stability—zero phase shift oscillator circuit holds all ringing frequencies to a drift of less than 1/6 cycle, eliminating the need for any frequency adjustment.

Type TR. A single-frequency generator available for any frequency from 16 to 66 $\frac{2}{3}$.

Both types of ringing generators can be equipped with automatic self-protection against short circuiting.

25-Watt Models

TYPE		Frequencies	INPUT		OUTPUT		OVERALL SIZE INCHES W.X.H.X.D.	Ship. Wt. Lbs.	PRICE EACH	
With Automatic Self- Protection	With Fuse Protection		†D.C. Volts	D.C. Amp.	†Volt- age Range	Watts (Total)			With Automatic Self- Protection	With Fuse Protection
6TMRA-25	6TMRB-25	*Any Frequency Combination and a Universal Spare Generator.....	50	3.33	85-175	125	23 or 30x10 $\frac{1}{2}$ x12 $\frac{23}{32}$	131	\$1095.00	\$930.00
TMRA-25	TMRB-25	Any 5 Frequency Combination.....	50	3.33	85-175	125	19, 23 or 30x10 $\frac{1}{2}$ x12 $\frac{23}{32}$	112	935.00	795.00
TMRA-25	TMRB-25	Any 4 Frequency Combination.....	50	2.67	85-175	125	19, 23 or 30x10 $\frac{1}{2}$ x12 $\frac{23}{32}$	93	765.00	640.00
TRA-25	TRB-25	Any Frequency from 16 to 66 $\frac{2}{3}$	50	0.66	85-175	25	19, 23 or 30x 5 $\frac{1}{4}$ x12 $\frac{23}{32}$	28	210.00	180.00
TRA-25-U	TRB-25-U	Used as Universal Spare.....	50	0.66	85-175	25	19, 23 or 30x 5 $\frac{1}{4}$ x12 $\frac{23}{32}$	20	160.00	135.00

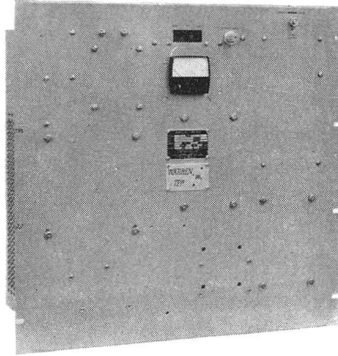
50-Watt Models

TYPE		Frequencies	INPUT		OUTPUT		OVERALL SIZE INCHES W.X.H.X.D.	Ship. Wt. Lbs.	PRICE EACH	
With Automatic Self- Protection	With Fuse Protection		†D.C. Volts	D.C. Amp.	†Volt- age Range	Watts (Total)			With Automatic Self- Protection	With Fuse Protection
6TMRA-50	6TMRB-50	*Any 5 Frequency Combination and a Universal Spare Generator.....	50	5.75	85-175	250	19, 23 or 30x10 $\frac{1}{2}$ x12 $\frac{23}{32}$	162	\$1510.00	\$1300.00
TMRA-50	TMRB-50	Any 5 Frequency Combination.....	50	5.75	85-175	250	23 or 30x10 $\frac{1}{2}$ x12 $\frac{23}{32}$	130	1300.00	1110.00
TMRA-50	TMRB-50	Any 4 Frequency Combination.....	50	4.60	85-175	200	19, 23 or 30x10 $\frac{1}{2}$ x12 $\frac{23}{32}$	109	1080.00	895.00
TRA-50	TRB-50	Any Frequency from 16 to 66 $\frac{2}{3}$	50	1.15	85-175	50	19, 23 or 30x 5 $\frac{1}{4}$ x12 $\frac{23}{32}$	30	280.00	250.00
TRA-50-U	TRB-50-U	Used as Universal Spare.....	50	1.15	85-175	50	19, 23 or 30x 5 $\frac{1}{4}$ x12 $\frac{23}{32}$	23	210.00	190.00

*Space for spare generator or start-stop relay is provided. †Nominal. ‡Adjustable.

When ordering, specify: series designation (TMR or TR); A or B Type (A—automatic self-protection, B—fuse protection); wattage (25 or 50 watts); ringing series (add suffix (H) harmonic, (S) synchrononic, (D) decimonic); rack size; and desired frequencies.

Type TPP Warren Transistor Power Packs



The Warren Transistor Power Pack is a complete, transistorized power, ringing and tone supply for PBX, PAX and PABX installations. It combines a battery charger/eliminator with a ringing generator and a dial/busy tone generator in a single compact, economical unit.

Charger/eliminator capacity: 3 to 30 amperes, 48 volts. See table below.

Ringer: input, 50 volts nominal; output, 7.5 watts, 100 volts, 20 cps.

Dial/busy tone generator: input, 50 volts nominal; output, 20 milliwatts, 600 cycles modulated at 120 cycles.

Line load regulation (used as battery charger): $\pm 1\%$ from 0 to 100% load, 30 millivolt ripple.

Current limit is set at 125% of rated capacity.

Line load regulation (used as battery eliminator): $\pm 2\%$ from 0 to 100% load, 30 millivolt ripple.

Size: width, 23 inches; depth, $8\frac{21}{32}$ inches; height, $22\frac{1}{2}$ inches.

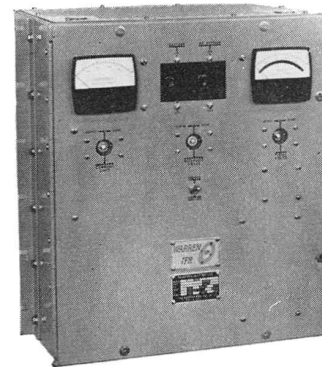
Type	INPUT		OUTPUT		Cells	Ship. Wt. Lbs.	Price Each
	Volts	Amp.	Volts	Amp.			
48TPP6	115	6.5	48-53	6	23, 24	125	\$542.00
48TPP9	115	9.4	48-53	9	23, 24	160	640.00
48TPP12	115	12.3	48-53	12	23, 24	207	752.00
48TPP16	115	16.1	48-53	16	23, 24	230	826.00
48TPP20	115	20.0	48-53	20	23, 24	235	958.00
48TPP30	115	29.6	48-53	30	23, 24	250	1495.00

OPTIONS: 1. Voltmeter.

2. W148A DPDT Failure Alarm Relay.

When ordering, specify Type, whether battery charger or eliminator is desired (if battery charger, specify number of cells; if eliminator, add suffix "E" to the Type and voltage setting). Ammeter and the W148A AC/DC failure alarm relay are available as optional accessories. A voltmeter is standard equipment.

Type TFR-E Warren Battery Eliminators



Available for 24 or 48-volt, single or three-phase operation. They may also be used as battery chargers.

All battery eliminators listed have a line/load regulation of $\pm 1\%$ and are available for either relay rack, wall, shelf, or floor mounting as indicated.

24-Volt—Single-Phase

Type	Input Volts	Output Volts	Amp.	*Type of Mounting	Size Inches	Ship. Wt. Lbs.	Price Each
24TFR3E	115	21- 27	3	R-W-S	19x13x20	105	\$285.00
24TFR6E	115	21- 27	6	R-W-S	19x13x20	130	325.00
24TFR12E	115	21- 27	12	R-W-S	19x13x20	155	545.00
24TFR24E	115	21- 27	24	R-W-S	19x13x20	238	875.00
24TFR32E	115	21- 27	32	R-W-S	19x13x20	270	940.00

24-Volt—Three-Phase

24TFR50TE	230	21- 27	50	R-W-F	23x15x36	447	\$1515.00
24TFR100TE	230	21- 27	100	R-W-F	23x15x36	588	1875.00
24TFR200TE	230	21- 27	200	F	28x20x58	910	2040.00

48-Volt—Single-Phase

48TFR3E	115	48- 56	3	R-W-S	19x13x20	130	\$320.00
48TFR6E	115	48- 56	6	R-W-S	19x13x20	155	493.00
48TFR9E	115	48- 56	9	R-W-S	19x13x20	200	535.00
48TFR12E	115 or 230†	48- 56	12	R-W-S	19x13x20	230	830.00
48TFR16E	115 or 230	48- 56	16	R-W-S	19x13x20	265	905.00
48TFR20E	115 or 230	48- 56	20	R-W-S	19x13x20	285	970.00
48TFR25SE	115 or 230	48- 56	25	R-W-S	19x13x20	300	1355.00
48TFR30SE	115 or 230	48- 56	30	R-W-S	19x13x20	310	1550.00
48TFR36SE	115 or 230	48- 56	36	R-W-S	19x13x20	340	1710.00
48TFR50SE	115 or 230	48- 56	50	R-W-S	19x13x20	380	1990.00

48-Volt—Three-Phase

48TFR25TE	230	48- 58	25	R-F	23x15x45 $\frac{1}{2}$	445	\$1430.00
48TFR37TE	230	48- 58	37	R-F	23x15x45 $\frac{1}{2}$	515	1705.00
48TFR50TE	230	48- 58	50	R-F	23x15x45 $\frac{1}{2}$	580	1930.00
48TFR75TE	230	48- 58	75	R-F	23x15x45 $\frac{1}{2}$	705	2675.00
48TFR100TE	230	48- 58	100	R-F	23x15x45 $\frac{1}{2}$	825	3020.00

130-Volt—Single-Phase

130TFR3E	115	120-148	3	R-W-S	19x13x20	200	\$675.00
130TFR5E	115	120-148	5	R-W-S	19x13x20	225	1020.00
130TFR10E	115	120-148	10	R-W-S	19x13x20	310	1530.00
130TFR15SE	115 or 230†	120-148	15	R-W-S	19x13x20	375	1815.00
130TFR20SE	115/230	120-148	20	R-W-F	23x15x36	525	2025.00
130TFR25SE	115/230	120-148	25	R-W-F	23x15x36	570	2175.00

130-Volt—Three-Phase

130TFR15TE	230	120-148	15	R-W-F	23x15x45 $\frac{1}{2}$	560	\$1895.00
130TFR25TE	230	120-148	25	R-W-F	23x15x36	715	2350.00
130TFR30TE	230	120-148	30	R-W-F	23x15x36	820	2650.00
130TFR50TE	230	120-148	50	F	28x20x58	1065	3310.00

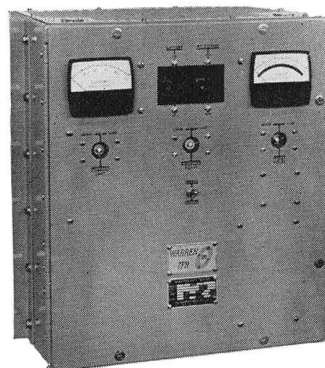
*R—Rack, W—Wall, S—Shelf, F—Floor.

Adaptor for wider racks, or stand for floor mounting, is supplied at no charge when specified.

†230-volt input is optional. Must be specified.

Prices are subject to change without notice.

Type TFR Warren Transistor Float Rectifiers

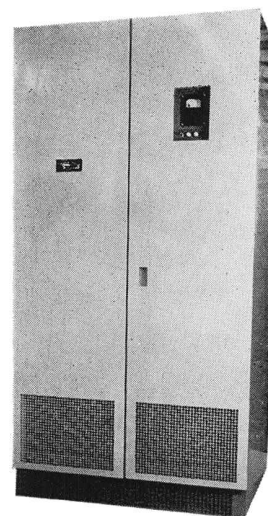


Type 48TFR50

The Warren Transistor Float Rectifier is a solid-state, constant-voltage, fully automatic battery charger specifically designed for telephone, microwave, and general communication applications. Silicon diodes are used for rectification. A transistor-magnetic amplifier control circuit provides d.c. output regulation of $\pm \frac{1}{2}\%$ from 0 to 100% load. D.C. output is filtered to reduce ripple to 30 millivolts or less, except on 130-volt models where the ripple is 100 millivolts or less.

Has no moving parts, and no aging adjustments are ever required. Freedom from maintenance results in a lower annual cost.

All models include as standard equipment a 2% d.c. ammeter, 1% d.c. voltmeter (1.2% at working voltage), two-pole a.c. circuit breaker, d.c. breaker or d.c. fuse, toggle switch to change from float to equalize, separate rheostats for float and equalize voltage adjustments, and terminals for remote sensing.



Type 48TFR800

All models may be operated in parallel with other TFR's or with constant-voltage rectifiers of other manufacture without modification. However, if equal or proportional load sharing is required, then the load sharing option must be specified.

Cabinet is constructed of heavy gage sheet steel with telephone gray baked enamel finish. Convenient hinged front cover. Mounting: R—Relay Rack, W—Wall, S—Shelf, F—Floor.

D.C. OUTPUT:

	Lead Acid Batteries	Nickel Cadmium Batteries
Float	2.15 to 2.20 volts/cell (normal)	1.4 volts/cell (normal)
Equalize Voltage	2.2 to 2.33 volts/cell (normal)	1.45 to 1.55 volts/cell (normal)
Float Voltage Adjustment Range	2.10 to 2.25 volts/cell	1.4 to 1.45 volts/cell
Float Voltage Regulation	$\pm \frac{1}{2}\%$ from 0 to 100% load with $\pm 10\%$ a.c. line variations at normal float voltage settings	
D.C. Current-Limit Setting	125% of rating, normal	

OPTIONS:

- | | |
|----------------------------------|------------------------------------|
| 1. A.C./D.C. Failure Alarm Relay | 4. 0-24 Hour Equalize Charge Timer |
| 2. Low D.C. Voltage Alarm Relay | 5. Remote Control Relay |
| 3. High D.C. Voltage Alarm Relay | 6. Load Sharing |

In addition, other input voltages and frequencies, other cell selections, and equipment to customer specifications are available on special order basis.

TFR TYPE NOMENCLATURE:

The following example provides an interpretation of the Warren TFR type designations:

48	TFR	50	S or T
D.C. Volts	Transistor Float Rectifier	D.C. Amp.	Single Phase (S) Three Phase (T)

Type TFR Warren Transistor Float Rectifiers

Single-Phase Chargers

24-Volt, Single-Phase, Filtered Models

Type	*A.C. INPUT			D.C. Out- put Amp.	INPUT WIRE SIZE		BRANCH CIRCUIT FUSES		Size Inches	†Cabinet Mounting	Ship. Wt. Lbs.	Price Each
	Volts	115 V.	AMP. 230 V.		115 V.	230 V.	115 V.	230 V.				
24TFR3	115	1.4	....	3	14	..	3	..	19x13x20	R-W-S	90	\$265.00
24TFR6	115	2.9	....	6	14	..	6	..	19x13x20	R-W-S	130	305.00
24TFR12	15	5.9	....	12	14	..	10	..	19x13x20	R-W-S	155	515.00
24TFR24	115	10.4	....	24	12	..	20	..	19x13x20	R-W-S	230	830.00
24TFR32	115	13	....	32	12	..	25	..	19x13x20	R-W-S	265	885.00

48-Volt, Single-Phase, Filtered Models

48TFR3	115	2.9		3	14	..	6	..	19x13x20	R-W-S	130	\$295.00
48TFR6	115	5.9	.....	6	14	..	10	..	19x13x20	R-W-S	155	\$490.00
48TFR9	115	7.8	.....	9	12	..	15	..	19x13x20	R-W-S	200	\$530.00
48TFR12	115 or 230	10.4	5.2	12	12	14	20	10	19x13x20	R-W-S	230	\$790.00
48TFR16	115 or 230	13	6.5	16	12	14	25	15	19x13x20	R-W-S	265	\$840.00
48TFR20	115 or 230	18	9	20	10	12	30	15	19x13x20	R-W-S	285	\$900.00
48TFR25S	115 or 230	23	11.5	25	8	12	40	20	19x13x20	R-W-S	300	\$1280.00
48TFR30S	115 or 230	28	14	30	8	10	50	25	19x13x20	R-W-S	310	\$1390.00
48TFR36S	115 or 230	35	17.5	36	6	10	60	30	19x13x20	R-W-S	340	\$1600.00
48TFR50S	115 or 230	46	23	50	4	8	80	40	19x13x20	R-W-S	380	\$1810.00
48TFR75S	115/230	60	35	75	2	6	125	60	23x15x36	R-W-F	575	\$2350.00
48TFR100S	115/230	90	45	100	0	4	150	75	23x15x36	R-W-F	760	\$2690.00

130-140-Volt, Single-Phase, Filtered Models

130TFR3	115 or 230	8	4	3	12	14	15	10	19x13x20	R-W-S	200	\$620.00
130TFR5	115 or 230	13	6.5	5	12	14	20	10	19x13x20	R-W-S	225	\$960.00
130TFR10	115 or 230	26	13	10	8	10	50	25	19x13x20	R-W-S	310	\$1460.00
130TFR15S	115 or 230	44	22	15	4	8	80	40	19x13x20	R-W-S	375	\$1730.00
130TFR20S	115/230	56	28	20	3	6	100	50	23x15x36	R-W-F	525	\$1920.00
130TFR25S	115/230	68	34	25	2	6	125	60	23x15x36	R-W-F	570	\$2090.00

Three-Phase Chargers

24-Volt, Three-Phase, Filtered Models

Type	A.C. INPUT		D.C. Output Amp.	Input Wire Size 115 V.	Branch Circuit Fuses 115 V.	Size Inches	†Cabinet Mounting	Ship. Wt. Lbs.	Price Each
	Volts	Amp.							
24TFR50T	230	5.5	50	14	15	23x15x36	R-W-F	430	\$1440.00
24TFR100T	230	11	100	12	20	23x15x36	R-W-F	560	\$1935.00
24TFR200T	230	21	200	8	35	28x20x58	F	850	\$3020.00
24TFR400T	230 or 460†	40	400	5	60	36x24x78	F	1250	\$4490.00

48-Volt, Three-Phase, Filtered Models

(For Lower Current Ratings, See Type A-TFR Listings)

48TFR400T	230 or 460†	80	400	1/0	100	36x24x78	F	2100	\$5750.00
48TFR800T	230 or 460†	160	800	3/0	300	42x32½x84	F	3590	\$9620.00

130-140-Volt, Three-Phase, Filtered Models

130TFR15T	230	9	15	14	15	23x15x45½	R-F	560	\$1810.00
130TFR25T	230	14	25	12	25	23x15x36	R-W-F	690	\$2230.00
130TFR30T	230	17	30	10	30	23x15x36	R-W-F	785	\$2520.00
130TFR50T	230	28	50	6	50	36x24x78	F	1045	\$3150.00
130TFR100T	230 or 460†	56	100	4	70	36x24x78	F	1725	\$4695.00

*Single-voltage models: Standard voltage (115), 110/120 taps $\pm 10\%$; optional voltage (230), 208/230 taps $\pm 10\%$.
 Dual-voltage models: 104-115/208-230 $\pm 10\%$. Frequency: 60 cps. $\pm 1\%$. NOTE: Optional voltage must be specified.
 †R—Relay rack, W—Wall, S—Shelf, F—Floor.
 †460 volts a.c. is optional, must be specified.

The data below is applicable to both Single-Phase Chargers and Three-Phase Chargers.

24-Volt Output:

Cells: Lead Acid Batteries 10, 11, 12
 Nickel Cadmium Batteries 15 thru 18.
 Float Volts: 21 to 27.
 Equalize Volts: 24 to 29.
 Ripple: 30 MV max.

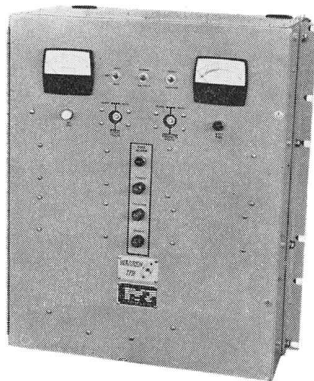
48-Volt Output:

Cells: Lead Acid Batteries 23, 24, 25.
 Nickel Cadmium Batteries 34 thru 37.
 Float Volts: 48 to 56.
 Equalize Volts: 50 to 59.
 Ripple: 30 MV max.

130-140 Volt Output:

Cells: Lead Acid Batteries 57 thru 66.
 Nickel Cadmium Batteries 86 thru 100.
 Float Volts: 120 to 148.
 Equalize Volts: 125 to 155.
 Nipple: 100 MV max.

Prices are subject to change without notice.



Type A-TFR Warren Transistor Float Rectifiers

A-Series, 48-Volt, Three-Phase, Filtered Models

Employs silicon controlled rectifiers which enable voltage control to be accomplished by small, low-level, transistor-magnetic amplifier circuits. The elimination of high-level magnetic amplifiers, which are inherently noisy and relatively large, makes these chargers smaller, lighter, and the quietest ever. As with all Warren chargers, no aging adjustments are ever required.

Output voltmeter may be connected to charger output, battery, power board, or remote voltage-sensing point.

Complete charger and battery protection. Any blown fuse or rectifier failure trips AC line contactor. Failure of one controlled rectifier will not damage others. Current limiting may be adjusted from 80-120% of charger rating.

Regulation is $\pm 1\frac{1}{2}\%$ from 0 to 100% rated load with input voltage variations of -10% to +15%.

Electrical noise is less than 26 dba, with F1A line weighting, 2B noise measuring set, and charger connected to battery whose ampere-hour rating is four times charger rating in amperes.

STANDARD EQUIPMENT:

1. Ammeter and Voltmeter with mirror scale and knife-edge pointer. Voltmeter is $\pm 1\%$ calibrated to $\pm 1\frac{1}{2}\%$ at working voltage.
2. Separate rheostats for control of Float and Equalize Voltages.
3. AC Line Contactor with thermal overload protection.
4. Terminals for Remote Voltage Sensing.
5. Remote Control Relay.
6. Terminals for Parallel Operation.
7. Terminals for connecting voltmeter to external voltage.
8. Float-Equalize Toggle Switch.
9. Auto-Manual Toggle Switch.
10. Normal-Emergency Cells Toggle Switch.
11. AC ON, Rectifier Failure, and Fuse Alarm Panel Lamps, Rectifier Failure terminals provided for external alarm.
12. Charger, Capacitor, and Sensing Circuit Fuses.
13. DC Fuse and Knife Disconnect Switch.
14. Current Limiting Circuit.
15. Circuit to trip line contactor on fuse or rectifier failure.
16. Equal or proportional load sharing with other Warren three-phase chargers.

OPTIONAL AND SPECIAL-ORDER EQUIPMENT:

1. Charge-Failure Alarm Relay (W348A, DPDT)*
2. Low-Voltage Alarm Relay (WLV48)*
3. High-Voltage Alarm Relay (WHV48)*
4. Stand for Floor Mounting.
5. Load Sharing with chargers of other manufacture.
6. Load Sharing with DC Generator (Diverter pole or equivalent compound generator).
7. Equalize Charge indicator lamp.
8. Special Cell selection.
9. Special input voltage.
10. Special input frequency.

*Any two of these three can be installed at any time without wiring changes.
All three are available on a Special Order Basis.

Type	INPUT (1) Volts Amp.		OUTPUT (2) Volts Amp.		Cells (3)	Input Wire Size (4)	Branch Circuit Fuses	Mounting (6)	Size Inches	Ship. Wt. Lbs.	Price Each
A48TFR25	230	5.7	48-57	25	23, 24, 25	14	15A	RR, Floor	23x15x26	314	\$1370.00
A48TFR37	230	8.3	48-57	37	23, 24, 25	12	20A	RR, Floor	23x15x26	348	1625.00
A48TFR50	230	11.0	48-57	50	23, 24, 25	12	20A	RR, Floor	23x15x26	365	1840.00
A48TFR75	230	16.0	48-57	75	23, 24, 25	10	30A	RR, Floor	23x15x26	404	2550.00
A48TFR100	230	21.5	48-57	100	23, 24, 25	8	35A	RR, Floor	23x15x26	470	2875.00
A48TFR200	230(5)	41.5	48-57	200	23, 24, 25	5	60A	RR, Floor	23x15x36	792	3725.00

- NOTES: 1. 208 or 230 volts, +15%, -10%, 60 cps, 3 phase.
 2. Rheostat adjustable.
 3. Also 23+3, charge by load.
 4. For 230-volt, 60-cps, 3-phase power service.
 5. This model may be strapped for 416 or 460 volts, +15%, -10%, 60 cps., 3 phase.
 6. Brackets for 30-inch rack furnished without charge when specified.

When ordering, specify Type from table above, and in addition specify: input voltage and frequency; number and type (lead antimony, lead calcium) of battery cells; type of mounting (relay rack or floor); accessory equipment, if any; special equipment, if any; load sharing particulars, if any.