



Industrial Series

Emergency Lighting Equipment

Instructions for Installation • Operation • Maintenance

**Series:
AS**

Specifications

- AC Supply Voltage** - 120/277 VAC, $\pm 10\%$, 60 Hz.
- Power Consumption** - **Model AS80:** 20 Watts Maximum ⁽¹⁾
All others: 75 Watts Maximum
- Output Voltage** - 6, 12 or 24 VDC (Determined by model).
- Discharge Duty Cycle** - 90 minutes of rated output power to $87\frac{1}{2}\%$ of nominal battery voltage.
Note: Refer to unit model label for maximum wattage capacity.
- Recharge Duty Cycle** - Per UL924 specifications.
- Operating Temperature** - 25°C , $\pm 5^{\circ}$
- Transfer Means** - Transfer circuit automatically energizes lamps upon loss of AC supply power. Battery charger circuitry incorporates a low voltage disconnect (LVD) feature to prevent deep discharge damage to battery during prolonged power outages.
- Test Means** - Push button switch simulates AC power failure. Switch actuation tests transfer function, battery, lamp readiness and charger response to battery discharge.
- Status Indicator** - **Model AS80:**
Pilot light indicates the presence of AC power and battery charge status:
Bright - High charge, battery charging.
Dim - Float state, battery charged and ready.
All Others:
Pilot light indicates the presence of AC power to unit.
Note: Pilot light does not indicate charge mode or battery condition.
- Battery Type** ⁽²⁾ - Maintenance-Free Sealed Lead-Calcium

1300652
1300654
1300660
1300661
1300665
1300823
1300886

⁽¹⁾ At nominal AC voltage.

⁽²⁾ Refer to unit model label for battery replacement part number.



IMPORTANT SAFEGUARDS

When using electrical equipment, basic safety precautions should always be followed including the following:

READ AND FOLLOW ALL SAFETY INSTRUCTIONS.

2. Do not use outdoors.
3. Do not let power supply cords touch hot surfaces.
4. Do not mount near gas or electric heaters.
5. Use caution when servicing batteries. Battery acid can cause burns to skin and eyes. If acid is spilled on skin or in eyes, flush acid with fresh water and contact a physician immediately.
6. Equipment should be mounted in locations and at heights where it will not readily be subjected to tampering by unauthorized personnel.
7. The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition.
8. Caution: Halogen lamp(s) may be used in this equipment. To avoid shattering: Do not operate lamp in excess of rated voltage, protect lamp against abrasion and scratches and against liquids when lamp is operating, dispose of lamp with care.
9. Halogen lamps operate at high temperatures. Do not store or place flammable materials near lamp.
10. Do not use this equipment for other than intended use.
11. Servicing of this equipment should be performed by qualified service personnel only.

SAVE THESE INSTRUCTIONS

Table B

Constant Value per Voltage System Wire Size (Maximum Voltage Drop 5%)

System	6 Volt				12 Volt				24 Volt					
	#12	#10	#8	#6	#12	#10	#8	#6	#10	#12	#10	#8	#6	#4
Constant	534	849	1350	2148	2137	3397	5403	8590	13660	8548	13588	21613	34363	54641

Uniform Loads

The maximum circuit length data in Table A (and derived from Table B) assumes that 100% of the load is concentrated at the end of the run. If equally sized loads can be equally spaced along the run, maximum circuit length can be increased by the multipliers shown in Table C.

Table C

Multiplier for Equally Sized, Equally Spaced Loads (Maximum Voltage Drop 5%)

Number of Fixtures	2	3	4	5	6	7	8	9	10	n
Multiply Distance By	1.333	1.500	1.600	1.670	1.714	1.750	1.777	1.800	1.818	$2n/(n-1)$

Installation

VOLTAGE DROP TABLES

When connecting remote lighting fixtures and/or exit signs to emergency lighting equipment, the circuit conductors must have the capacity to maintain proper voltage to all lamps. Voltage drop must be limited to 5% of nominal, per the National Electrical Code.

The following tables will assist in planning layouts for emergency lighting systems.

Table A
Wiring Distance in Feet (Maximum Voltage Drop 5%)

Total Watts	6 Volt Wire Size				12 Volt Wire Size				24 Volt Wire Size			
	#12	#10	#8	#6	#12	#10	#8	#6	#12	#10	#8	#6
6	89	141	225	357	356	566	900	1431	1424	2264	3602	5727
7.2	74	118	187	298	296	471	750	1193	1187	1887	3001	4772
8	67	106	168	268	267	424	675	1073	1068	1698	2701	4295
9	59	94	150	238	237	377	600	954	949	1509	2401	3818
12	44	70	112	178	178	283	450	715	712	1132	1801	2863
13	42	65	103	165	164	261	415	660	657	1045	1662	2643
18	30	47	75	119	118	188	300	477	474	754	1200	1909
25	21	34	54	85	85	135	216	343	341	543	864	1374
28	19	30	48	77	76	121	193	306	305	485	771	1227
36	15	23	37	60	59	94	150	238	237	377	600	954
44	12	19	30	48	48	77	122	195	194	308	491	780
50	10	17	27	43	42	67	108	171	171	271	432	687
56	9	15	24	38	38	60	96	153	152	242	385	613
70	7	12	19	30	30	48	77	122	122	194	308	490
100	5	8	13	22	21	33	54	86	85	135	216	343
150		5	9	15	14	22	36	57	57	90	144	229
200			6	10	10	17	27	43	42	67	108	171
250			5	8	8	13	21	34	34	54	86	137
300				7	7	11	18	28	28	45	72	114
400				5	5	8	13	21	21	34	54	85
500						6	10	17	17	27	43	68

Values not shown in Table A may be calculated using the following formulas.

I. Maximum Length (Feet) = $\frac{\text{Table B Constant Value}}{\text{Maximum Load (Watts)}}$
 Example: Find the maximum circuit length for #8 wire on a 24 volt system with an 80 watt load.
 Maximum Length (Feet) = $21613 \div 80 = 270$ feet.

II. Maximum Load (Watts) = $\frac{\text{Table B Constant Value}}{\text{Maximum Length (Feet)}}$
 Example: Find the maximum circuit load for 120 feet of #12 wire on a 12 volt unit.
 Maximum Load (Watts) = $2137 \div 120 = 17$ watts.

Mounting

Installation of batteries is recommended following cabinet mounting. Keyhole openings and hardware knockouts are provided at rear of cabinet for mounting purposes. Specifically designed wall bracket or shelf is available from Dual-Lite for mounting cabinet.

Wiring

AC supply wiring (or optional line cord) enters through KO on right side of cabinet.

See Figure 1.

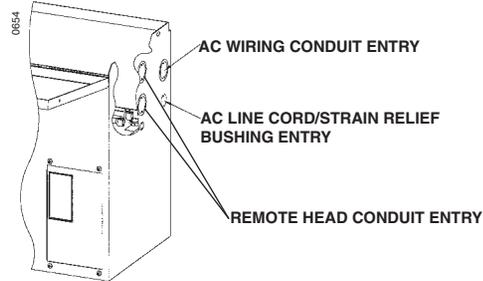


Figure 1

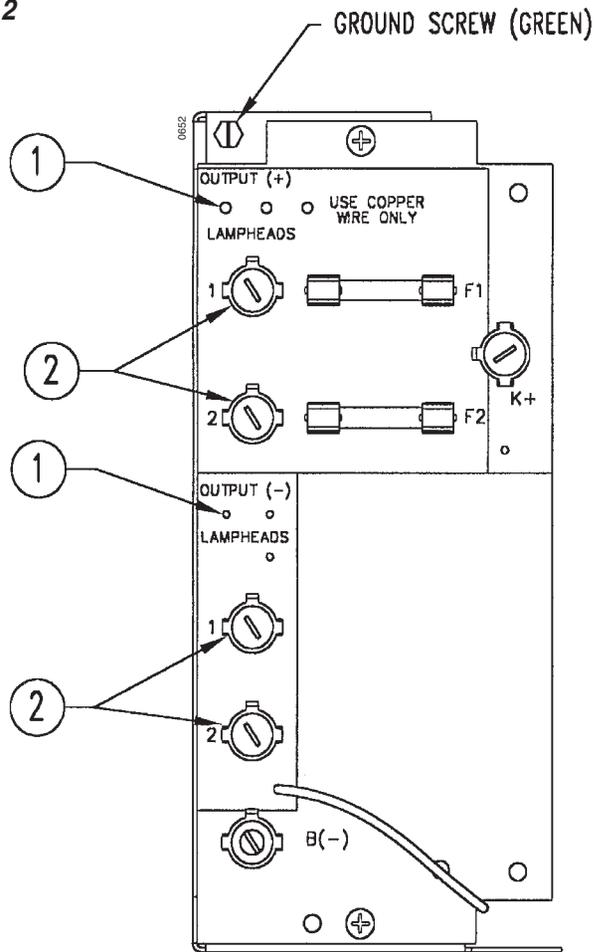
Connect non-energized, unswitched 120 or 277 VAC, 60 Hz to the following transformer leads:

- 120 VAC - Black and white leads
 - 277 VAC - Red and white leads
- Important:** Cap off unused transformer lead(s)* and connect ground conductor to green screw located at the top rear of insert. See Fig. 2, Fig. 4 and Fig. 5.
 * 24 volt models provide a 347 VAC tap lead in addition to the 120 and 277 VAC leads, requiring the capping of two unused leads. See Figure 3.

Lighting Head Connection

Unit mounted heads:
General: Remove appropriate KOs in top cover. Install lamp heads using supplied hardware. Bend anti-rotation tabs to the vertical position.
Model AS80: Connect blue and yellow lighting head leads to matching #18 AWG (unfused) blue and yellow insert leads using standard wire nuts. See Fig. 4.
All Other Models: Connect blue leads to OUTPUT (+) lamphead pins and yellow leads to OUTPUT (-) lamphead pins. See callout ③ in Fig. 2 and Fig. 5.
Remotely mounted heads:
General: Remotely mount lighting heads using appropriately sized conductors for run length to prevent voltage drop. See Voltage Drop "Table A". Route remote conductors through selected knockout(s) in side of cabinet using approved conduit and connectors (supplied by others).
Model AS80: Using standard wire nuts, connect one lead from each remote head to #14 AWG blue, fused insert lead and the remaining lead from each head to #14 AWG yellow insert lead.
All Other Models: Connect one half of remote load across OUTPUT (+) 1 and OUTPUT (-) 1 lamphead terminals and the other half across OUTPUT (+) 2 and OUTPUT (-) 2 lamphead terminals on distribution board. See callout ④ in Fig. 2 and Fig. 5. Each set of remote output terminals on the distribution board is fused for one half of the rated unit capacity. Refer to unit model label for maximum wattage of unit.

Figure 2



Battery Maintenance, Cleaning, etc.

To properly maintain and service the batteries, refer to the instructions below.

Batteries must be kept clean and terminals should be coated with vaseline oil. Vaseline oil is recommended in place of grease. The oil can be applied with a brush and will cover and flow easier into place. Battery oils are not included with the service kits. Vaseline oil can be prepared in the following manner:

Purchase a large jar of vaseline and an equal amount of mineral oil. Place the vaseline into a pot and heat until melted. Add an equal amount of mineral oil to the melted vaseline and mix thoroughly. The mixture of the two will provide a heavy oil that will stay solvent and allow for application to the battery with a brush.

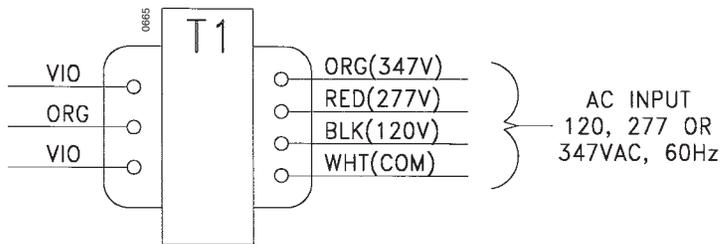
Replacing an Emergency Lamp

De-energize AC input power. Disconnect red battery lead. Turn lamp ring one-half turn counterclockwise.

With one hand, push the top two lamp lead wires up to the swivel while pulling on the Emergency Lamp until the lamp base is reachable. If both the lamp that is being replaced and the replacement lamp have terminals, change directly. If either lamp has wire leads attached, the following must be done:

1. Cut leadwires on the lamp being replaced as close to lamp as possible.
2. If replacement lamp has wire leads, cut them to approximately three inches and wire nut to leadwires from unit.

Figure 3 (AC wiring - 24V units only)



Operation

Unit will automatically maintain the battery in a ready state.

AS80 Series: Charge rate is indicated by a pilot light which glows brightly during high charge and dimly in the ready state.

All Models: In the event of a power failure, the unit will automatically switch the connected emergency lights on. Emergency operation is provided for a minimum of 90 minutes. During prolonged power outages, the unit will automatically extinguish the emergency lights when the battery capacity falls below 80%. Upon restoration of normal power, the unit will automatically disconnect the emergency lights and recharge the unit to a ready state. A manual test switch allows functional testing at any time.

NOTE: Self-testing, self-diagnostic models with over 80 watts of capacity require a minimum load of 35 watts for accurate lamp failure indications.

Maintenance

Test Cycling

Every three months, if there has been no power failures, a short manual test should be performed to assure proper function. Prior to the test, the unit pilot light should be glowing. To perform the test, actuate the unit test switch for a minimum of 30 seconds.

Model AS80: When the switch is activated, the pilot light should extinguish and the connected emergency lights illuminate. Release the switch to end the test. The pilot light should glow brightly for a few minutes before fading back to the dim (ready) state.

All Other Models: When the switch is activated the connected emergency lights should illuminate. Release the switch to end the test and return unit to the ready state.

Conditioning Cycles

Once a year if power failures have been infrequent or of short duration, a full battery conditioning cycle should be performed. To perform the test, de-energize the AC circuit to which the unit is connected. Allow the unit to operate for a full 90 minutes before restoring AC power. This test puts the battery through a full discharge/recharge cycle over its intended range and also provides a rigorous test of overall unit operation.

Taking a Unit Out of Service

If a unit is to be deliberately taken out of service for an extended period of time, ensure that the unit is in the ready state (battery fully charged). Disconnect the positive (red) battery lead and insulate.

Figure 4

Wiring Diagram
AS80 Series

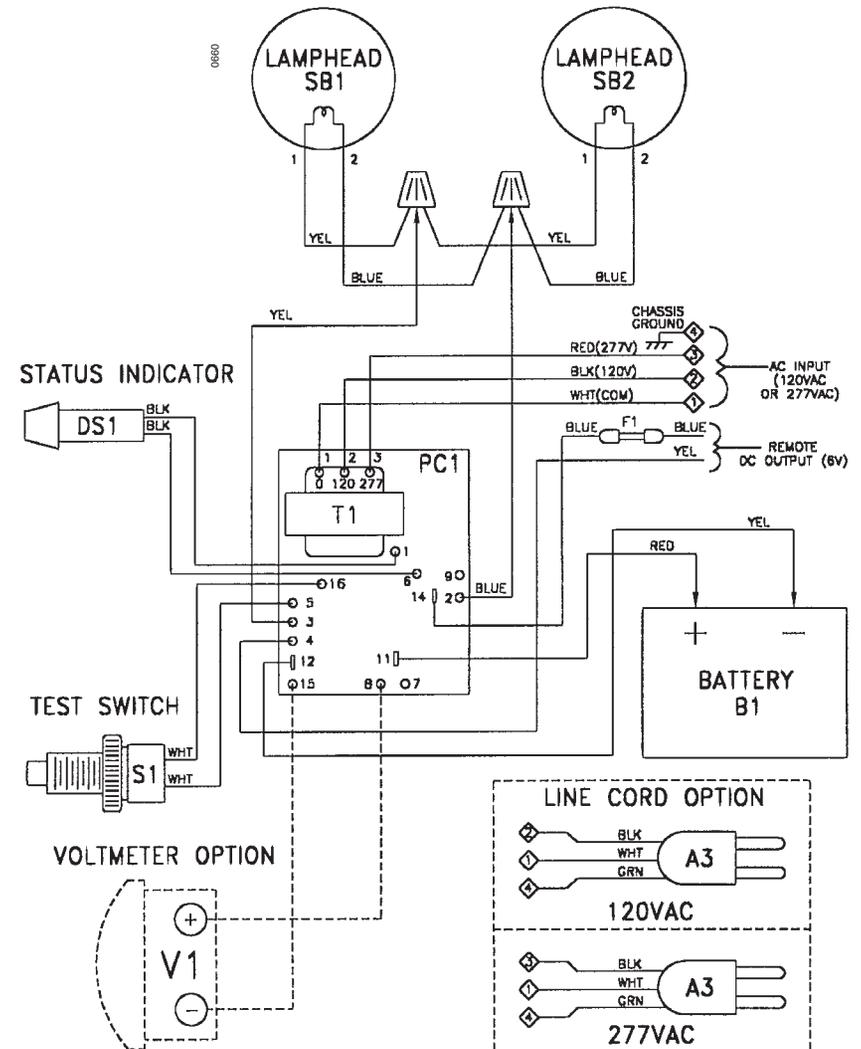


Figure 5

Wiring Diagram
All Other AS Series Models

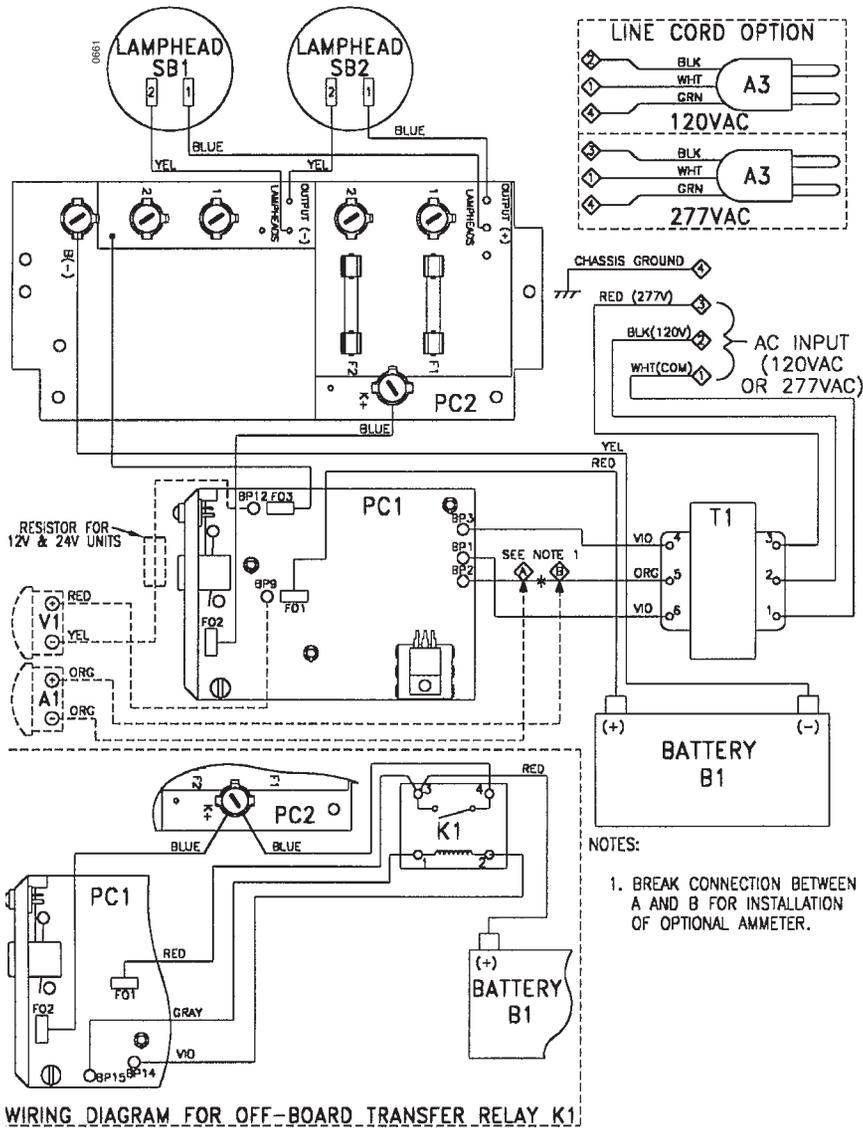
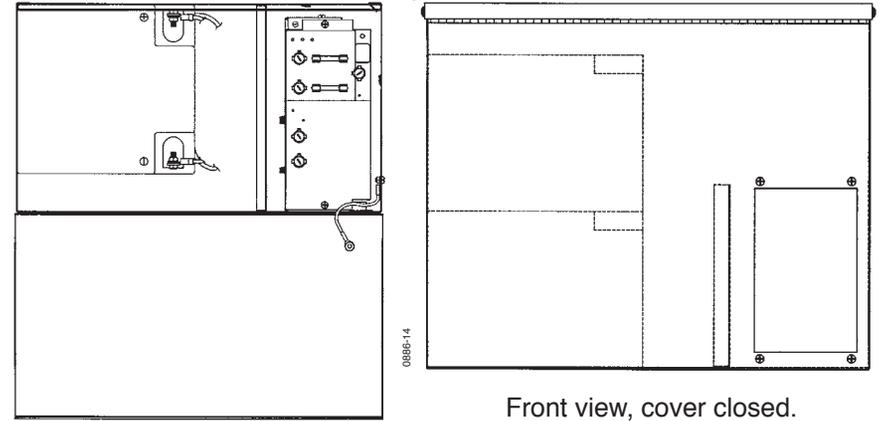


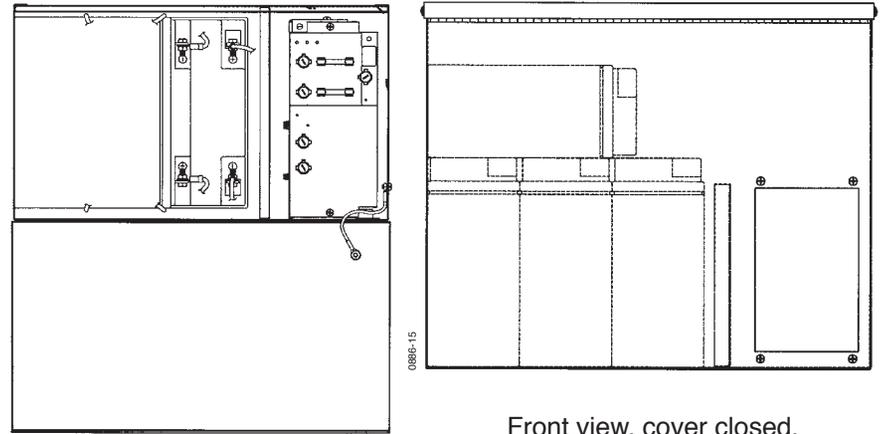
Figure 14



Top view, cover open

Front view, cover closed.
Phantom lines show battery position.

Figure 15



Top view, cover open

Front view, cover closed.
Phantom lines show battery position.

Figure 11

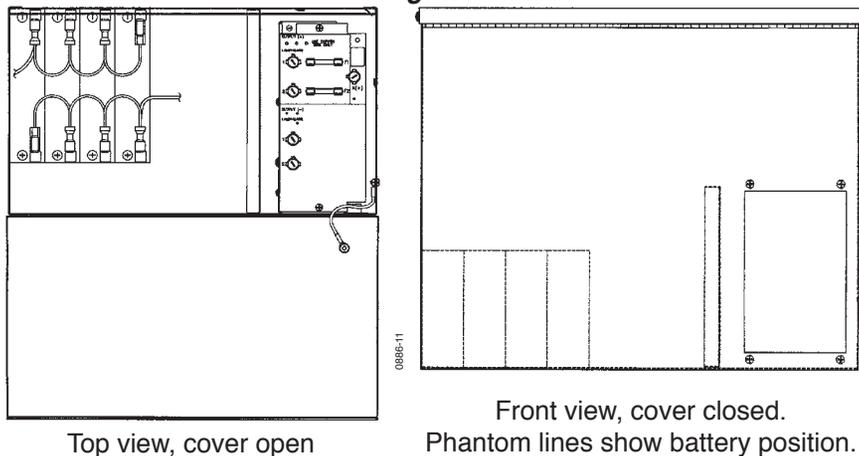


Figure 12

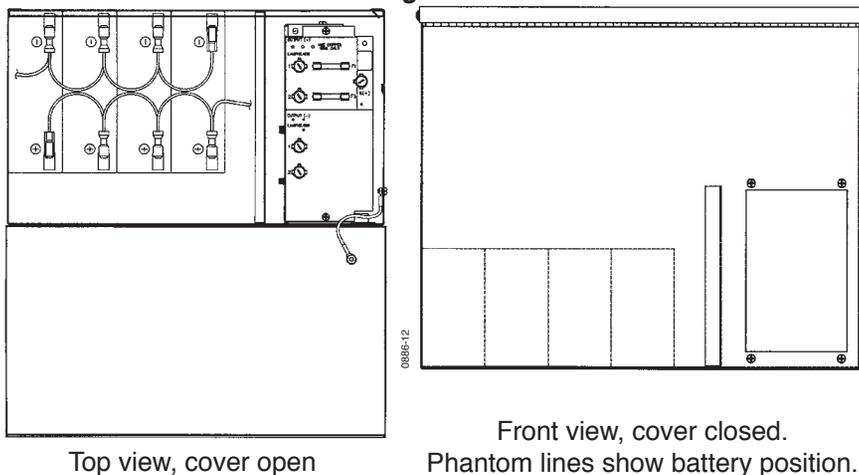
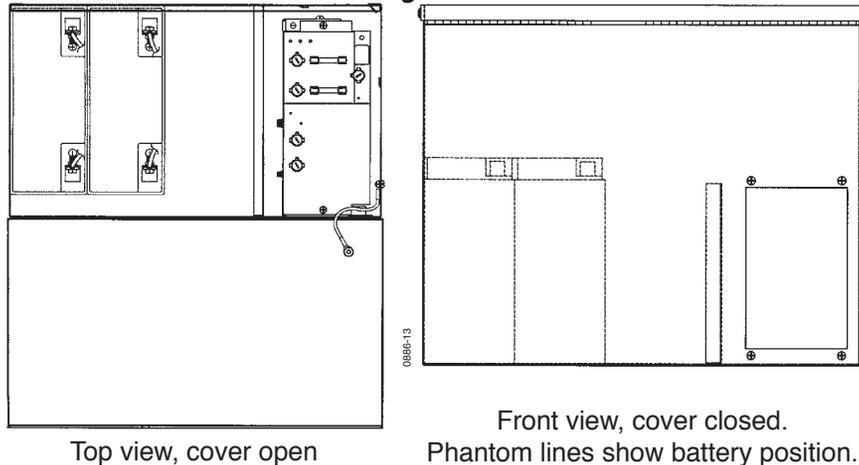


Figure 13



Battery Installation

Important: Battery must be connected before AC power is applied to unit. Do not connect battery if AC power is not available. Extended discharge damage to the battery may occur if connected to an unenergized unit for prolonged periods.

WARNING: Batteries can produce high current. Avoid contact with battery terminals. Use insulated tools during installation.

Batteries are packed in unit shipping carton. Wiring harness (packed inside unit) must be affixed to batteries, and batteries placed into unit in proper orientation. Connect red insert lead to positive (+) battery terminal lead, and yellow insert lead to negative (-) battery terminal lead. Refer to chart (below) for proper wiring diagram and battery placement inside unit.

Model	Battery System	Battery Connection	Battery Placement
AS80	Four 6V, parallel	Fig. 6	Fig. 11
AS130	Four 6V, parallel	Fig. 6	Fig. 12
AS180-12V	Two 12V, parallel	Fig. 7	Fig. 13
AS270-12V	Two 12V, parallel	Fig. 7	Fig. 14
AS360-12V	Four 12V, parallel	Fig. 8	Fig. 15
AS180-24V	Two 12V, series	Fig. 9	Fig. 13
AS270-24V	Two 12V, series	Fig. 9	Fig. 14
AS360-24V	Four 12V, series/parallel	Fig. 10	Fig. 15

Energization

Prior to applying AC power to the unit, review the following checklist:

- Unit is connected to an unswitched AC circuit
- AC input voltage matches transformer connections
- Unused transformer lead is capped off
- All electrical connections are tight and properly insulated
- Unit battery is installed and connected properly

Once these criteria are checked, it is safe to energize the unit with AC power.

Operational check

AS80 Series: Pilot light should glow brightly following unit energization. Allow unit to charge for 24 hours. The pilot light should glow dimly indicating unit ready state. Actuate unit test switch to check proper transfer circuit and lighting head operation.

All Other Models: Pilot light should be on following unit energization. Allow unit to charge for 24 hours. Actuate unit test switch to check for proper transfer circuit and lighting head operation.

Figure 6

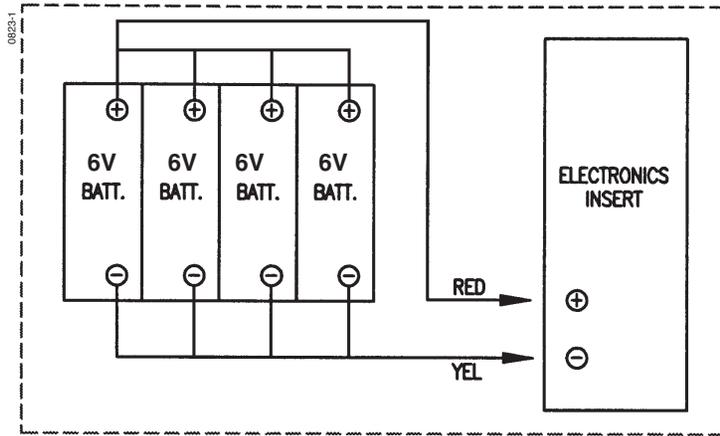


Figure 7

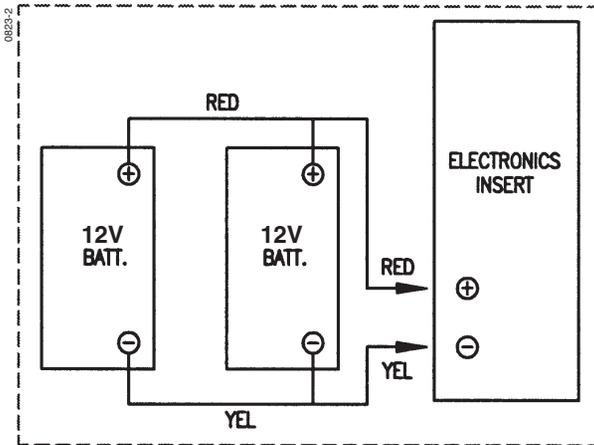


Figure 9

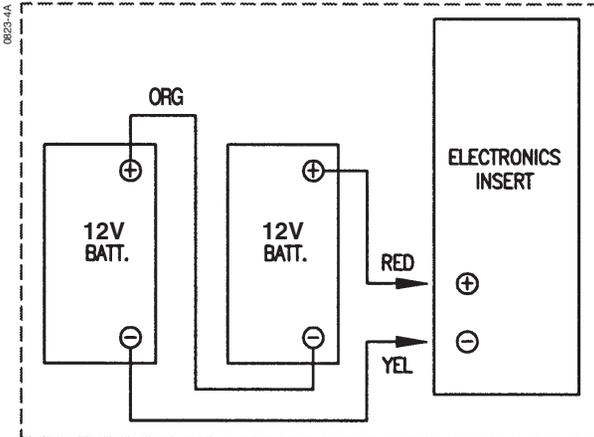


Figure 8

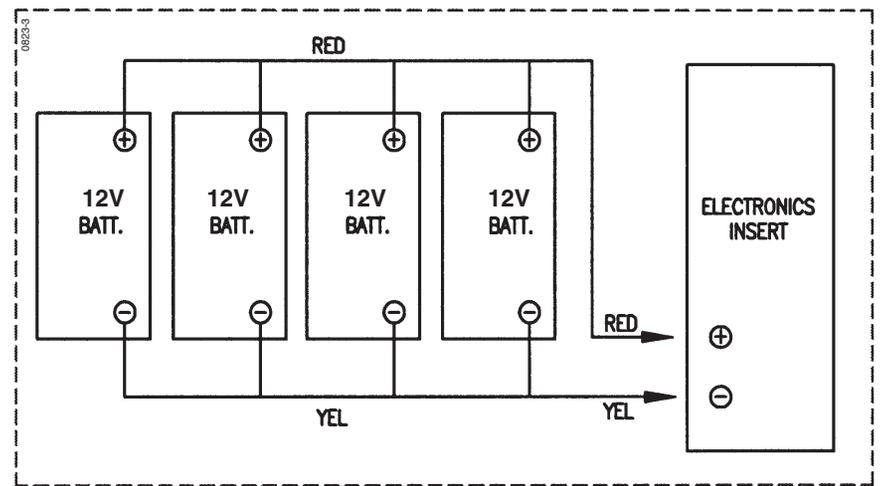


Figure 10

