

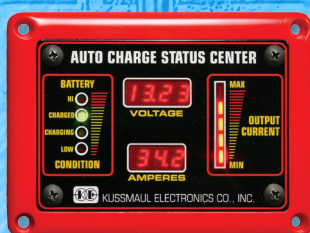


KUSSMAULTM ELECTRONICS

ENERGIZED AND READY, WHEN SECONDS COUNT



Inverters



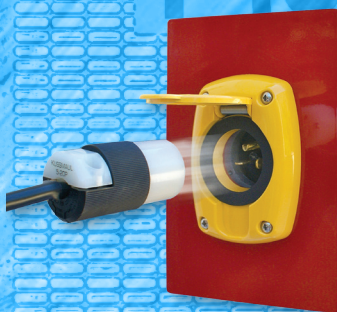
**Displays /
Instrumentation**



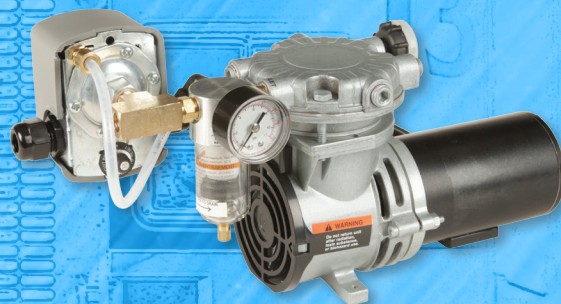
Battery Chargers



Dash Mounted Power



Ejection Systems



Air Compressor Systems

Battery Charging

Battery Indicators / Meters

Solar Power Charging

Ejection Units

DC Power Management

Air Compressors

Kits And Packages

Installation Accessories

Engine / Vehicle Accessories

A HISTORY OF KUSSMAUL PRODUCT DEVELOPMENT

1975

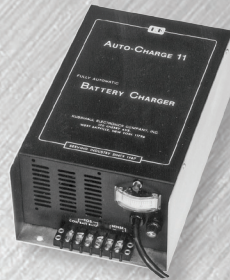
1st Battery
Charger



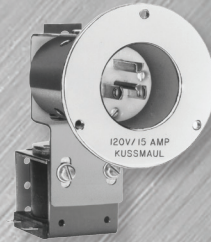
Auto Charge 10
10 Station Charger



Auto Charge 11
Dual Output Charger



Auto Eject
Automatic Power
Line Disconnect



1980's



Load Manager
Automatic Load
Shedding System



Air Eject
Automatic Air Line
Disconnect



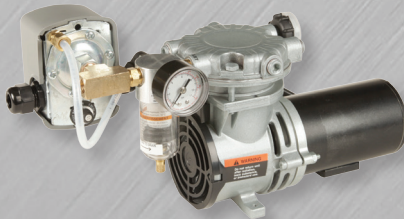
Super Auto Eject
Patented Power Line
Disconnect



Pump Plus
Compressor and Battery
Charger System



Auto Charge 1200
Patented sense
technology



Auto Pump 12V HP
Automatic Compressor System



Super 30 Auto Eject
Patented High Powered
Line Disconnect



Super 16 Auto Eject
European Power Line
Disconnect



Auto Charge LPC
Low Profile Charger

2000's

2015



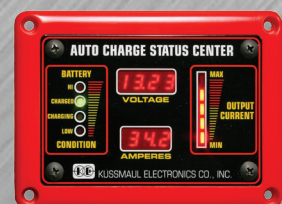
Dash Mounted Power



Inverter Charger



Vehicle Mounted Solar
Panel Systems



Auto Charge
Status Center

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	B. Battery Savers	
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BATTERY CHARGERS



Charger
Selection Guide
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Auto Charge
12 Series
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Auto Charge
1000
Page 10



Auto Charge
20/20
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Auto Charge
1200
Built-In Display
Page 12



Auto Charge
1200
Remote Display
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40/20
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Auto Charge
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Maintenance
Master
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Auto Charge
11 Series
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Auto Charge
2000
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Auto Charge
4000
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Auto Charge
D & D2
Page 20



Auto Charge
20
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LPC
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Euro Chargers
Series
Page 23








Waterproof Charger
WP-35
Page 24



Battery Saver
Low Ripple Series
Page 25

CHARGER SELECTION GUIDE

SINGLE BATTERY BANK SYSTEMS SELECTION CHART

SINGLE BATTERY BANK SYSTEMS																		
<div><div></div> Not Recommended</div> <div><div></div> OK</div> <div><div></div> Recommended</div>			Average Battery Ratings CCA: 700 Amp Hour: 100															
PARASITIC LOADS IN AMPS			0	5	10	0	5	10	0	5	10	0	5	10	20	0	5	10
CHARGER SERIES	AMPS	PAGE																
AUTO CHARGE																		
AUTO CHARGE 12	12	9																
AUTO CHARGE 12HO	20	9																
AUTO CHARGE 1200	40	13																
LOW PROFILE																		
LPC 7	7	5																
LPC 20	20	6																
LPC 40	40	6																
LPC 80	80	7																
EV																		
EV-20	20	8																
EV-40	40	8																
AUTO CHARGE / BATTERY SAVER																		
AUTO CHARGE 1000	18	10																
AUTO CHARGE 20/20	40	11																
AUTO CHARGE 35/10	45	14																
AUTO CHARGE 40/20	60	15																
AUTO CHARGE D	33	20																
WATERPROOF																		
WP-35	35	24																
PUMP PLUS																		
PUMP PLUS 1000	18	49																
PUMP PLUS 1200	40	50																
AC D PUMP PLUS	33	53																

These chargers are for average recharge rates and average sized batteries. For specific applications, please contact our sales or engineering department with battery size, parasitic loads and required recharge time.

CHARGER SELECTION GUIDE

DUAL BATTERY BANK SYSTEMS SELECTION CHART

DUAL BATTERY BANK SYSTEMS

Not Recommended
 OK
 Recommended



Average
 Battery
 Ratings
 CCA: 700
 Amp Hour: 100



DDEC SYSTEMS



Main Battery



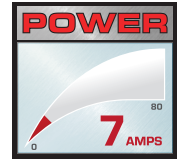
Engine Battery

PARASITIC LOADS IN AMPS			0	5	10	0	5	10	0	5	10	0	5	10
BATTERY CHARGER SERIES	AMPS	PAGE												
AUTO CHARGE														
AUTO CHARGE 11	10	17	Green	Yellow	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
AUTO CHARGE 11H0	20	17	White	Green	Green	Green	Yellow	Red	Red	Red	Red	Red	Red	Red
AUTO CHARGE / BATTERY SAVER														
AUTO CHARGE 2000	18	18	Green	Green	Yellow	Red	Red	Red	Red	Red	Red	Red	Red	Red
AUTO CHARGE 4000	45	19	White	White	Green	Green	Green	Green	Green	Green	Yellow	Red	Red	Red
AUTO CHARGE D2	33	20	White	White	White	White	White	White	White	White	White	Green	Green	Green
EURO														
EURO II	12	23	Green	Yellow	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
EURO II VHO	40	23	White	Green	Green	Green	Green	Green	Green	Yellow	Red	Red	Red	Red
PUMP PLUS														
PUMP PLUS H0	11	52	Green	Yellow	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
PUMP PLUS 2000	18	51	Green	Green	Yellow	Red	Red	Red	Red	Red	Red	Red	Red	Red

These chargers are for average recharge rates and average sized batteries. For specific applications, please contact our sales or engineering department with battery size, parasitic loads and required recharge time.

LOW PROFILE CHARGER 7 - SINGLE BATTERY BANK

- Charge Single Battery Bank
- Power Sensitive Electronics
- Low Profile Case Fits in Tight Locations



Features

- 7 Amps for charging vehicle batteries
- Three step charging: bulk, absorption, float
- Light weight, small low profile size
- Clean output poses no interference with radios and other mobile devices



- Gel cell/lead-acid switch selects optimum charge/float voltages based on battery type
- Charger Status indicator light - changes color according to output
- Current limiting prevents damage from overload
- Load activated cooling fan allows continuous operation at full-rated output
- Float / 3 Step selector switch protects batteries when charging under continuous load
- Meets CE requirements
- Designed for rigors of emergency vehicle use; heavy duty stainless steel case

Part Number	Description	Electrical Data				Dimensions			Wt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
445-4290-5	LPC 7	12	7	120 / 240	2.0 / 1.0	8.62"	4.93"	2.47"	3

LOW PROFILE CHARGER 20 & 40 - SINGLE BATTERY BANK

- Charge Single Battery Bank
- Power Sensitive Electronics
- Low Profile Case Fits in Tight Locations



LPC 20



LPC 40

20 & 40 Amp Features

- 20 & 40A models for charging battery
- Clean output poses no interference with radios and other mobile electronics
- Auxiliary 15A output circuit with power source selector switch for operating accessory loads: air compressor pumps, hand lights or handheld radios
- Front panel connections for remote display and auxiliary loads
- Designed for rigors of emergency vehicle use; heavy duty aluminum case



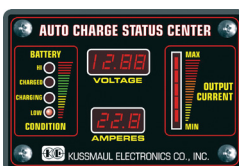
Remote Display Options



Bar Graph Display
091-200-IND

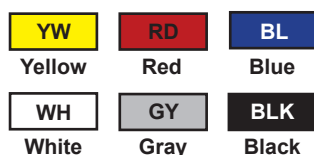


Status Center Display
in Watertight Case
For LPC 20: 091-194B-IND-WT-XX
For LPC 40: 091-194-IND-WT-XX



Status Center Display
For LPC 20: 091-194B-IND
For LPC 40: 091-194-IND

Color Options



Optional Accessory

E-Z Slide Mount Plate: 091-200-EZM

For slide-in installation and removal of the LPC 20 or LPC 40 in hard to access areas and spaces with minimal vertical clearance



Part Number	Description	Electrical Data				Dimensions			Wt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-200-12	LPC 40, w/ Bar Graph Display	12	40	120	7.0	13.25"	6.80"	3.30"	7
091-200-12-194	LPC 40, w/ Status Center	12	40	120	7.0	13.25"	6.80"	3.30"	7
091-200-12-194-WT-XX	LPC 40, w/ Watertight Display	12	40	120	7.0	13.25"	6.80"	3.30"	7
091-207-12	LPC 20, w/ Bar Graph Display	12	20	120	7.0	13.25"	6.80"	3.30"	7
091-207-12-194B	LPC 20, w/ Status Center	12	20	120	7.0	13.25"	6.80"	3.30"	7
091-207-12-194B-WT-XX	LPC 20, w/ Watertight Display	12	20	120	7.0	13.25"	6.80"	3.30"	7
091-200-EZM	EZ Slide Mount Plate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

All units also available in 240 Vac Input, contact the sales department for part number

LOW PROFILE CHARGER 80 - SINGLE BATTERY BANK

- Charge Single Battery Bank
- Power Sensitive Electronics
- Low Profile Case Fits in Tight Locations



Features

- 80A for charging battery
- Clean output poses no interference with radios and other mobile electronics
- Auxiliary 15A output circuit with power source selector switch for operating accessory loads: air compressor pumps, hand lights or handheld radios
- Front panel connections for remote display and auxiliary loads
- Designed for rigors of emergency vehicle use; heavy duty aluminum case

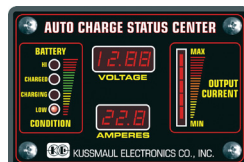


BATTERY CHARGERS

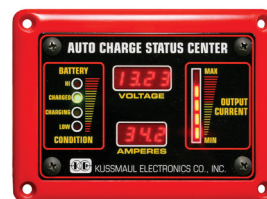
Remote Display Options



Bar Graph Display
091-200-IND



Status Center Display
091-194C-IND



Status Center Display
in Watertight Case
091-194C-IND-WT-XX

Color Options

YW Yellow	RD Red
WH White	GY Gray
BL Blue	BLK Black

Part Number	Description	Electrical Data				Dimensions			Wt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-206-12	LPC 80, w/Bar Graph Display	12	80	120	13	13.75"	7.00"	4.09"	10
091-206-12-194C	LPC 80, w/ Status Center	12	80	120	13	13.75"	7.00"	4.09"	10
091-206-12-194C-WT-XX	LPC 80, w/ Watertight Display	12	80	120	13	13.75"	7.00"	4.09"	10

All units also available in 240 Vac Input, contact the sales department for part number

24 Vdc version available, see Page 22 for details

EV CHARGER SERIES - SINGLE BATTERY BANK

- Charge Single Battery Bank
- Auxiliary Output for Electronics
- Compact Case



EV 20



EV 40

Features

- 20 and 40A models for charging battery
- Low profile design: saves valuable compartment and under seat space
- Clean output poses no interference with radios and other mobile electronics
- Auxiliary 15A output circuit with power source selector switch for operating accessory loads: air compressor pumps, hand lights or handheld radios
- Heavy duty terminal block for secure connections
- Durable powder coat finish
- Available as kit with remote battery meter
- Designed for rigors of emergency vehicle use, heavy duty aluminum case
- Optional mounting plate features slide-in and lock design for easy installation/removal under seats and other hard to access locations



EV-20 Features

- 20A rating, clean output - no electronic interference
- 2 step charging, bulk-float, no overcharging
- Operates on 120V
- Lowest profile design, only 2.32" high

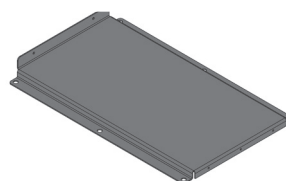
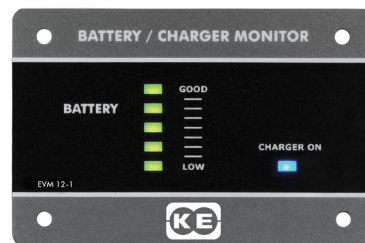
EV-40 Features

- Fast 3 step charging: Produces up to 40A output to quickly replenish batteries, then switches to lower float voltage maintenance mode for no overcharging
- Battery type selector switch to program use with Gel Cell/Flooded Lead Acid/AGM batteries
- Operates on 90-250V input, auto range
- Low profile design, only 3.2" high

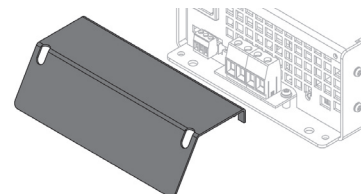
Optional Accessories

Remote Bar Graph Display: 023-5353-1

- "Charger On" LED
- Bar graph battery condition
- Operates when charger is not powered



Slide-in Mounting Plate Assembly: 444-5279-0
Easy installation under seats and hard to access locations



Kick Plate: 444-5280-0
Protects front panel connections

Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
445-5393-0	EV-20, Charger	12	20	120/240	3.1	13.12"	6.80"	2.32"	5
445-5399-0	EV-20, Charger & Display	12	20	120/240	3.1	13.12"	6.80"	2.32"	5
445-5262-0	EV-40, Charger	12	40	120/240	6.2	13.12"	6.80"	3.13"	7
445-5265-0	EV-40, Charger & Single Display	12	40	120/240	6.2	13.12"	6.80"	3.13"	8
445-5264-0	EV-40, Charger & Dual Display	12	40	120/240	6.2	13.12"	6.80"	3.13"	9
444-5279-0	Mounting Plate -- EV20/40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
444-5280-0	Kick Plate Guard -- EV20/40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

AUTO CHARGE® 12 SERIES - SINGLE BATTERY BANK

- Charge Single Battery
- Provide Power for Onboard Electronics
- Front Panel Amp Meter



12



12 HO

Features

- 12 and 20A, models for charging battery
- Automatic operation regulates output to a single battery bank
- Front panel amp meter indicates output current. Optional vehicle side mount indicator
- Designed for rigors of emergency vehicle use; heavy duty aluminum case with protective front panel plate and wire strain relief
- Model Auto Charge 12, UL recognized

Optional Configurations

AC Outlet in Front Panel:
15A GFI duplex outlet with circuit breaker protection provides plug-in point for AC accessories (PIM option)



Dual Voltage Input:
Selector switch on front panel for 120 or 240V, 50-60 hz. input (DV)



Model Shown: Auto Charge 12

Remote Display Options



Bar Graph Display
Model 12: 091-165-016
Model 12HO: 091-199-001



LED Display
Model 12: 091-11-102-12

Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-165-12	Auto Charge 12	12	12	120	2.5	4.50"	5.50"	11.00"	12
091-165-12-DV	Auto Charge 12 DV	12	12	120/240	2.5/1.3	4.50"	5.50"	11.00"	12
091-170-12	Auto Charge 12 HO	12	20	120	4.7	4.25"	6.75"	12.75"	16
091-170-DV-12	Auto Charge 12 HO-DV	12	20	120/240	4.7/2.3	4.25"	6.75"	12.75"	16
091-170-PIM	Auto Charge 12 HO-PIM	12	20	120	4.7	4.25"	6.75"	12.75"	16
091-12PIM	Auto Charge 12 PIM	12	12	120	2.5	4.25"	6.75"	12.75"	12

AUTO CHARGE® 1000 PLC - SINGLE BATTERY BANK

- Charge Single Battery Bank at 15 Amps
- Power Auxiliary Loads with 3 Amp 'Battery Saver'
- Remote Display Included

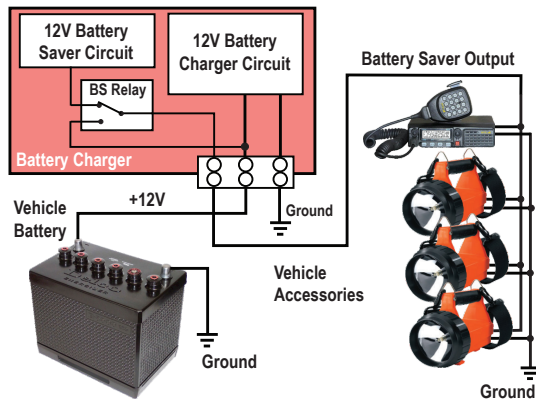


Features

- 18A total: 15A battery charger, 3A battery saver
- Microprocessor controlled, completely automatic operation regulates output to a single battery bank
- Precision voltage controller senses battery voltage, eliminating need for sense wires
- Programmable Parasitic Load Compensation allows for user input of total accessory load amps on the vehicle. This allows the charger to shift the absorption stage set point so the battery voltage drops to the float voltage when desired current is reached
- Battery Type Selection Switches: Lead-Acid, Gel Cell, AGM or Odyssey
- Float / 3-Step Charge Mode Selection Switches
- Automatic current limit
- Battery Saver On/Off switch is used to bypass the Battery Saver and apply all 18 amps to charge the battery
- Patent pending



Battery Saver Wiring Diagram

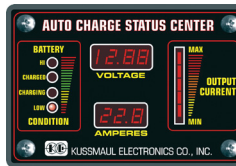


Battery Saver Operation: When the battery charger is operating, the vehicle's accessories are powered by the 12V battery saver circuit, internal to the charger. When the Charger is powered off, a relay inside the charger switches the vehicle accessories directly to the battery

Remote Display Options



Bar Graph Display
091-199-001



Status Center Display
091-194B-IND



Status Center Display
in Watertight Case
091-194B-IND-WT-XX

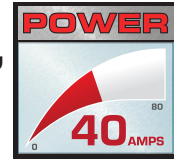
Color Options

YW	RD	BL
Yellow	Red	Blue
WH	GY	BLK
White	Gray	Black

Part Number	Description	Electrical Data				Dimensions			Wt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-215-12	Auto Charge 1000, w/ Bar Graph Display	12	15 / 3	120	3.5	9.35"	5.90"	4.725"	11
091-215-12-194B	Auto Charge 1000, w/ Status Center	12	15 / 3	120	3.5	9.35"	5.90"	4.725"	11
091-215-12-194B-WT-XX	Auto Charge 1000, w/ Watertight Display	12	15 / 3	120	3.5	9.35"	5.90"	4.725"	11

AUTO CHARGE® 20/20 - SINGLE BATTERY BANK

- Charge Single Battery Bank at 20 Amps
- Power Auxiliary Loads with 20 Amp 'Battery Saver'
- Front Panel Amp Meters

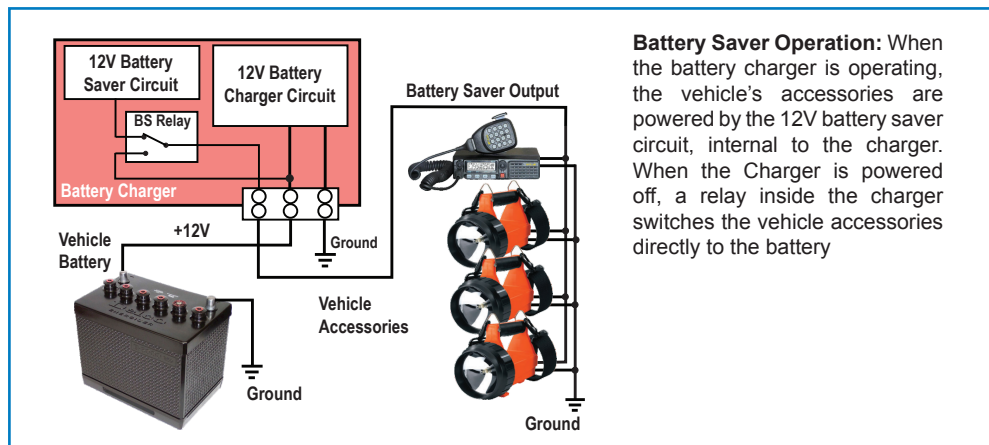


Features

- 40A total: 20A battery charger, 20A battery saver
- Automatic operation regulates output to a single battery bank
- Separate 20 Amp ATC fuse protected "Battery Saver" output eliminates drain on vehicle battery when in station
 - Automatically disconnects auxiliary vehicle loads from battery when charger is energized and powers them from the internal power supply
- Clean output poses no interference with radios and other mobile devices
- 20A output with automatic overload current limit
- Dual cooling fans
- Reverse polarity protected
- AC input circuit breaker protection
- Designed for rigors of emergency vehicle use; heavy duty aluminum case



Battery Saver Wiring Diagram



Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-216-20/20	Auto Charge 20/20	12	20 / 20	120	8.5	13.125"	8.250"	5.233"	13

AUTO CHARGE® 1200 BUILT-IN DISPLAY-SINGLE BATTERY BANK

BATTERY CHARGERS

- Charge Single Battery Bank at 40 Amps
- Power Onboard Electronics
- Built-in Display



Features

- 40A output quickly recovers batteries
- Automatically charges and supports parasitic DC loads: data terminals, radios, hand lights, etc. assuring battery is ready for vehicle start
- Automatic operation regulates output to a single battery bank
- A patented built-in sense circuit checks battery voltage 120 times per second to compensate for voltage drop in charging wires providing quick re-charge, with no overcharge
- Choice of Built-in Display options:
 - Bar Graph or Digital
- Choice of Remote Displays:
 - Bar Graph
 - Status Center
 - Status Center in Watertight Case
- Designed for rigors of emergency vehicle use; heavy duty aluminum case
- Optional E-Z Slide Mount Plate for slide-in installation and removal of the Auto Charge 1200 charger in hard to access areas
- Gel cell/lead-acid switch selects optimum charge/float voltages based on battery type

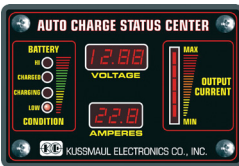


Auto Charge 1200 with
Built-in Status Center Display

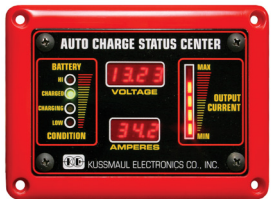
Remote Display Options



Bar Graph Display
091-199-001



Status Center Display
091-194-IND



Status Center Display
in Watertight Case
091-194-IND-WT-XX

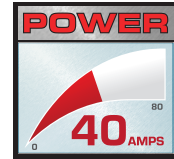
Color Options

YW	RD	BL
Yellow	Red	Blue
WH	GY	BLK
White	Gray	Black

Part Number	Description	Electrical Data				Dimensions			Wgt
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-187-12	Auto Charge 1200	12	40	120	10	13.25"	7.0"	5.25"	26
52-37-2100	Auto Charge 1200 with status center	12	40	120	10	13.25"	7.0"	5.25"	26
091-200-EZM	EZ Slide Mount Plate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

AUTO CHARGE® 1200 REMOTE DISPLAY - SINGLE BATTERY BANK

- Charge Single Battery Bank at 40 Amps
- Power Onboard Electronics
- Remote Display Included



Features

- 40A output quickly recovers batteries
- Automatically charges and supports parasitic DC loads: data terminals, radios, hand lights, etc. assuring battery is ready for vehicle start
- Automatic operation regulates output to a single battery bank
- A patented built-in sense circuit checks battery voltage 120 times per second to compensate for voltage drop in charging wires providing quick re-charge, with no overcharge
- Choice of Remote Display:
 - Bar Graph
 - Status Center
 - Status Center in Watertight Case
- Designed for rigors of emergency vehicle use; heavy duty aluminum case
- Gel cell/lead-acid switch selects optimum charge/float voltages based on battery type



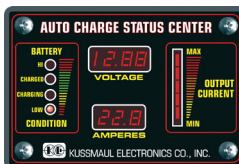
Remote Display Options



Bar Graph Display
091-199-001

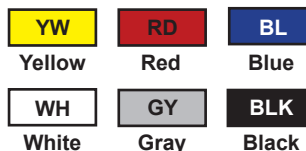


Status Center Display
in Watertight Case
091-194-IND-WT-XX



Status Center Display
091-194-IND

Color Options



Optional Accessory

E-Z Slide Mount Plate: 091-200-EZM

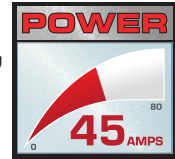
For slide-in installation and removal of the Auto Charge 1200 Remote charger in hard to access areas and spaces with minimal vertical clearance



Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-187-12-REMOTE	1200 Remote w/ Bar Graph	12	40	120	10	13.25"	7.0"	5.25"	26
091-187-12-R-194	1200 Remote w/ Status Center	12	40	120	10	13.25"	7.0"	5.25"	26
091-187-12-R-194-WT-XX	1200 Remote w/ Watertight S.C.	12	40	120	10	13.25"	7.0"	5.25"	26
091-200-EZM	EZ Slide Mount Plate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

AUTO CHARGE® 35/10 - SINGLE BATTERY BANK

- Charge Single Battery Bank at 35 Amps
- Power Auxiliary Loads with 10 Amp 'Battery Saver'
- Remote Display Included

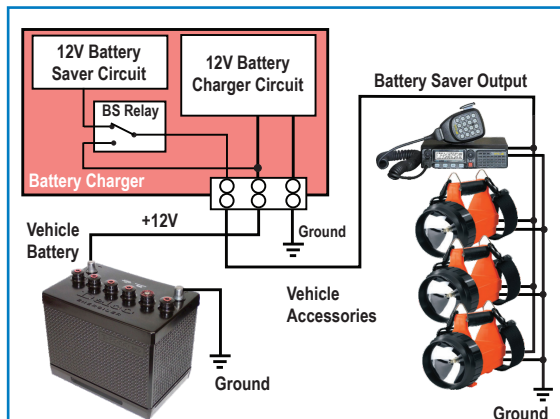


Features

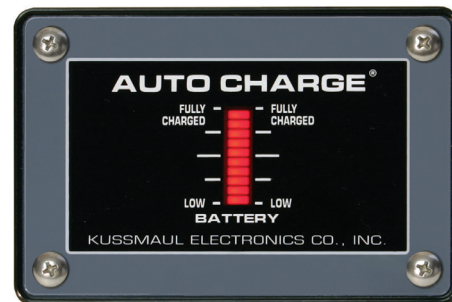
- 45A total: 35A battery charger, 10A battery saver
- Automatic operation regulates output to single battery bank
- A patented built-in sense circuit checks battery voltage 120 times per second to compensate for voltage drop in charging wires providing quick re-charge, with no overcharge
- Separate 10A "Battery Saver" output eliminates drain on vehicle battery when in station
 - Automatically disconnects auxiliary vehicle loads from battery when charger is energized
 - Ideal for charging hand lights and portable radios
 - 10A output with automatic overload current limit
 - Not recommended for powering highly sensitive electronic loads
- Front panel LED displays: AC power applied, Battery Saver circuit overload
- Remote Bar Graph Display included
- Designed for rigors of emergency vehicle use; heavy duty aluminum case with protective front panel plate and wire strain relief



Battery Saver Wiring Diagram



Battery Saver Operation: When the battery charger is operating, the vehicle's accessories are powered by the 12V battery saver circuit, internal to the charger. When the Charger is powered off, a relay inside the charger switches the vehicle accessories directly to the battery



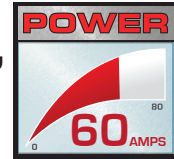
Remote Bar Graph Display Included:
091-199-001

- Provides state-of-charge status when in station
- Indicates charger "On" and operating

Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-35/10	AC 35/10 w/ Bar Graph Display	12	35	120	10	14.00"	5.50"	5.25"	26

AUTO CHARGE® 40/20 - SINGLE BATTERY BANK

- Charge Single Battery Bank at 40 Amps
- Power Auxiliary Loads with 20 Amp 'Battery Saver'
- Remote Display Included



Features

- 60A total: 40A battery charger, 20A battery saver
- Automatic operation regulates output to a single battery bank
- Separate 20 Amp ATC fuse protected "Battery Saver" output eliminates drain on vehicle battery when in station
 - Clean output poses no interference with radios and other mobile devices
- Battery Type Selector Switch: Lead-Acid/AGM or Gel-Cell
- 1-hour "boost" voltage for rapid recovery
- Automatic current limit
- Reverse polarity protected
- AC input circuit breaker protection

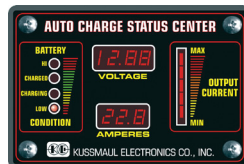


BATTERY CHARGERS

Remote Display Options



Bar Graph Display
091-199-001



Status Center Display
091-194-IND



Status Center Display
in Watertight Case
091-194-IND-WT-XX

Color Options

YW Yellow	RD Red
WH White	GY Gray
BL Blue	BLK Black

Part Number	Description	Electrical Data				Dimensions			Wt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-216-40/20	Auto Charge 40/20, Bar Graph Display	12	40 / 20	120	8.5	13.25"	7.13"	5.25"	13
091-216-40/20-194	Auto Charge 40/20, Status Center	12	40 / 20	120	8.5	13.25"	7.13"	5.25"	13
091-216-40/20-194-WT-XX	Auto Charge 40/20, Watertight Display	12	40 / 20	120	8.5	13.25"	7.13"	5.25"	13

Auto Charge 1 For Charging Small Batteries

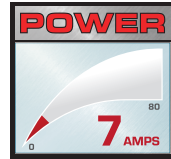


Auto Charge 1

Features

- 1A charge rate ideal for small 12V batteries (5-20 Amp/Hour), no overcharge
- Automatically charges battery
- Low ripple output, won't cause interference with electronics
- Current limited, cannot be overloaded
- Compact, sturdy molded case with mounting flanges for vehicle installation
- Convection cooled, no fans

Maintenance Master For Auxiliary Generators



Maintenance Master

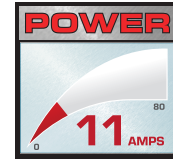
Features

- 5A, 12V charge rating (6 & 24V units also available)
- Designed specifically for maintaining generator start batteries
- Automatically charges and shuts off at charge completion, no overcharge
- Cannot over charge battery
- Ammeter indicates charge rate
- Rugged aluminum case designed for industrial use
- Compact size, wall mount

Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-31-12	Auto Charge 1	12	1	120	.5	3.50"	2.25"	3.50"	3
091-7-12	Maintenance Master	12	5	120	1	5.30"	5.50"	9.75"	9
091-7-24	Maintenance Master, 24 Volt	24	2.5	120	1	5.30"	5.50"	9.75"	9

AUTO CHARGE® 11 SERIES - DUAL BATTERY BANKS

- Charge Dual Battery Banks
- Power for Onboard Electronics
- Front Panel Amp Meter



11



11 HO

Features

- 10 and 20A, models for charging battery
- Automatically charges dual battery banks utilizing independent sense circuits that control voltage and current to each battery, thus parasitic loads on one battery have no effect on the second
- Full amperage output is available to either battery if the adjacent bank does not require charging, thus optimizing use of available power when charging banks with differing parasitic load rates
- Front panel amp meter indicates total output current
- Optional Remote Bar Graph display or LED indicator
- Designed for rigors of emergency vehicle use: heavy duty aluminum case with protective front panel plate and wire strain relief
- Model 11, UL recognized



Model Shown: Auto Charge 11

Optional Configurations

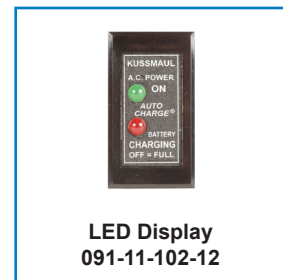
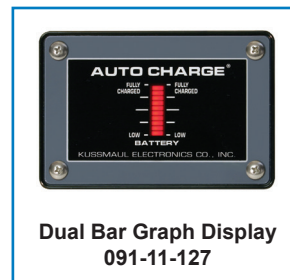
AC Outlet in Front Panel:
15A GFI duplex outlet with circuit breaker protection provides plug-in point for AC accessories (PIM option)



Dual Voltage Input:
Selector switch on front panel for 120 or 240V, 50-60 hz. input (DV)



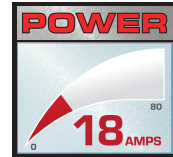
Remote Display Options



Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-11-12	Auto Charge 11	12	10	120	2.5	4.375"	5.50"	11.375"	12
091-11DV-12	Auto Charge 11 DV	12	10	120/240	2.5/1.3	4.375"	5.50"	11.375"	12
091-11HO-12	Auto Charge 11 HO	12	20	120	4.7	4.25"	6.75"	12.75"	19
091-11HO-DV-12	Auto Charge 11 HO-DV	12	20	120/240	4.7/2.4	4.25"	6.75"	12.75"	19
091-11HO-PIM	Auto Charge 11 HO-PIM	12	20	120	4.7	4.25"	6.75"	12.75"	19
091-11PIM	Auto Charge 11 PIM	12	10	120	2.5	4.25"	6.75"	12.75"	12

AUTO CHARGE® 2000 - DUAL BATTERY BANKS

- Charge Dual Battery Banks at 15 Amps
- Power Auxiliary Loads with 3 Amp 'Battery Saver'
- Remote Display Included

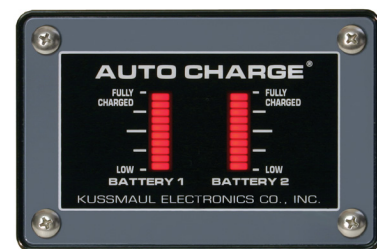
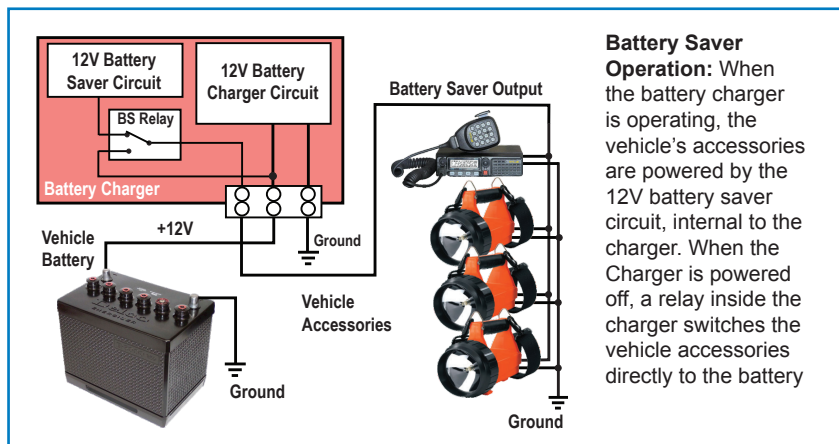


Features

- 18A total: 15A charging, 3A battery saver
- Automatically charges dual battery banks utilizing independent sense circuits that control voltage and current to each battery, thus parasitic loads on one battery have no effect on the others
- A patented built-in sense circuit checks battery voltage 120 times per second to compensate for voltage drop in charging wires providing quick re-charge, with no overcharge
- Full amperage output is available to any battery if the adjacent banks do not require charging, optimizing use of available power in charging banks with differing parasitic load rates
- Separate 3A "Battery Saver" output eliminates drain from auxiliary loads on vehicle battery when in station
 - Automatically disconnects auxiliary vehicle loads from battery when charger is energized and powers them from the internal power supply
 - Ideal for charging hand lights and portable radios
 - 3A output with automatic overload current limit
 - Not recommended for powering highly sensitive electronic loads
- Designed for rigors of emergency vehicle use; heavy duty aluminum case



Battery Saver Wiring Diagram



Remote Bar Graph Display Included: 091-39-IND

- Provides state-of-charge status when in station
- Indicates charger "On" and operating

Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-39-12	AC 2000, w/ Dual Bar Graph	12	15	120	3.5	9.35"	5.90"	4.725"	17

AUTO CHARGE® 4000 - DUAL BATTERY BANKS

- Charge Dual Battery Banks at 40 Amps
- Power Auxiliary Loads with 5 Amp 'Battery Saver'
- Remote Display Included



Features

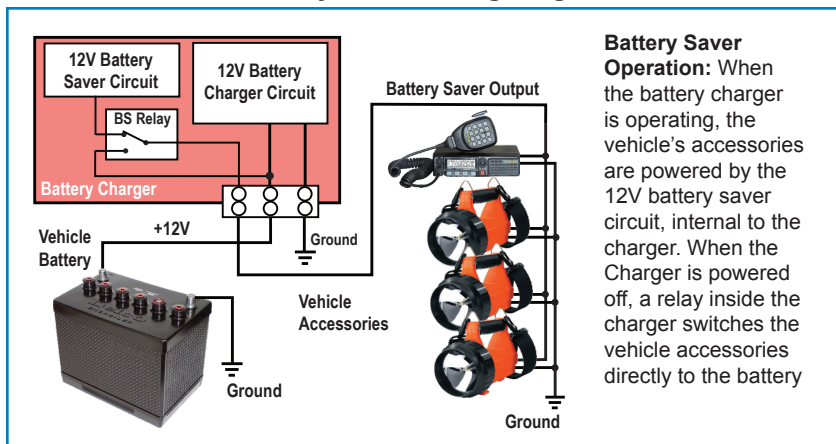
- 45A total: 40A charging, 5A battery saver
- Automatically charges dual battery banks utilizing independent sense circuits that control voltage and current to each battery, thus parasitic loads on one battery have no effect on the others
- A patented built-in sense circuit checks battery voltage 120 times per second to compensate for voltage drop in charging wires providing quick recharge, with no overcharge
- Full amperage output is available to any battery if the adjacent banks do not require charging, optimizing use of available power in charging banks with differing parasitic load rates
- Separate 5A "Battery Saver" output eliminates drain from auxiliary loads on vehicle battery when in station
 - Automatically disconnects auxiliary vehicle loads from battery when charger is energized and powers them from the internal power supply
 - Ideal for charging hand lights and portable radios
 - 5A output with automatic overload current limit
 - Not recommended for powering highly sensitive electronic loads
- Designed for rigors of emergency vehicle use; heavy duty aluminum case



Remote Bar Graph Display Included: 091-39-IND

- Provides state-of-charge status when in station
- Indicates charger "On" and operating

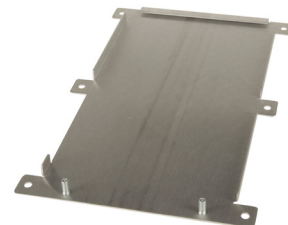
Battery Saver Wiring Diagram



Optional Accessory

E-Z Slide Mount Plate:

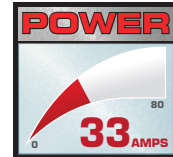
For slide-in installation and removal of the Auto Charge 4000 charger in hard to access areas and spaces with minimal vertical clearance



Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-89-12	AC 4000, w/ Dual Bar Graph	12	40 / 5	120	8	13.25"	7.0"	5.25"	24
091-200-EZM	EZ Slide Mount Plate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

AUTO CHARGE® D & D2 - MULTIPLE BATTERY BANKS

- Charge Dual or Triple Battery Banks at 28 Amps
- Power Auxiliary Loads with 5 Amp 'Battery Saver'
- Remote Display Included

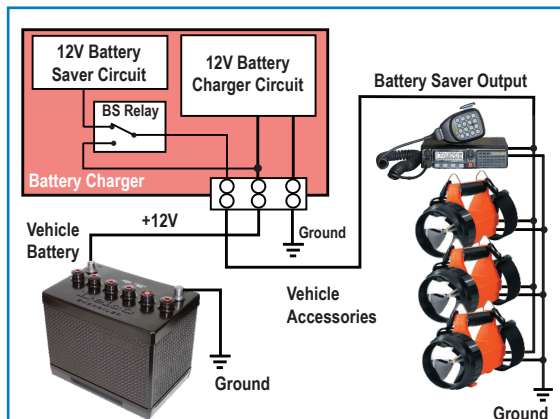


Features

- 33A total: 28A battery charger, 5A battery saver
- Designed for DDEC Vehicles
- Automatic operation regulates output to multiple battery banks
- A patented built-in sense circuit checks battery voltage 120 times per second to compensate for voltage drop in charging wires providing quick re-charge, with no overcharge
- Model D: 2 battery banks
- Model D2: 3 battery banks
- Separate 5A "Battery Saver" output eliminates drain on vehicle battery when in station
 - Automatically disconnects auxiliary vehicle loads from battery when charger is energized
 - Ideal for charging hand lights and portable radios
 - 5A output with automatic overload current limit
 - Not recommended for powering highly sensitive electronic loads
- Front panel indicators: AC power applied, Battery Saver circuit overload
- Designed for rigors of emergency vehicle use; heavy duty aluminum case



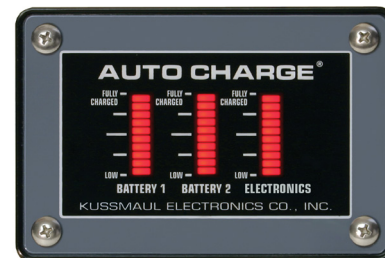
Battery Saver Wiring Diagram



Battery Saver Operation: When the battery charger is operating, the vehicle's accessories are powered by the 12V battery saver circuit, internal to the charger. When the Charger is powered off, a relay inside the charger switches the vehicle accessories directly to the battery



Remote Bar Graph Display Included with Auto Charge D: 091-66-IND



Remote Bar Graph Display Included with Auto Charge D2: 091-74-IND

- Provides state-of-charge status when in station
- Indicates charger "On" and operating

Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-66-12	AC D, w/ Dual Bar Graph	12	25 / 5	120	8	5.25"	7.0"	13.25"	27
091-74-12	AC D2, w/ Triple Bar Graph	12	25 / 5	120	8	5.25"	7.0"	13.25"	28

AUTO CHARGE® 20 - THREE BATTERY BANKS

- Charge Three Battery Banks at 20 Amps
- Power Onboard Electronics
- Front Panel Amp Meter



Features

- 20A, 12V output
- Automatically charges three battery banks utilizing independent sense circuits that control voltage and current to each battery, thus parasitic loads on one battery have no effect on the others
- Full amperage output is available to any battery if the adjacent banks do not require charging, optimizing use of available power in charging banks with differing parasitic load rates
- Front panel amp meter indicates total output current
- Optional remote display
- Designed for rigors of emergency vehicle use; heavy duty aluminum case with protective front panel plate and wire strain relief



Optional Configurations

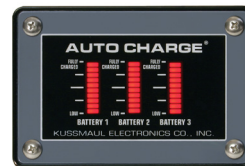
AC Outlet in Front Panel:
15A GFI duplex outlet with circuit breaker protection provides plug-in point for AC accessories (PIM option)



Dual Voltage Input:
Selector switch on front panel for 120 or 240V, 50-60 hz. input (DV)



Remote Display Options



Bar Graph Display
091-1118-022-12



LED Display
091-11-102-12

Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-10-12	Auto Charge 20	12	20	120	4.7	4.25"	6.75"	12.75"	22
091-10-24	Auto Charge 20, 24 Volt	24	10	120	4.7	4.25"	6.75"	12.75"	22
091-10-DV-12	Auto Charge 20 DV	12	20	120/240	4.7/2.3	4.25"	6.75"	12.75"	22
091-10PIM	Auto Charge 20 PIM	12	20	120	4.7	4.25"	6.75"	12.75"	22

- Charge 24V Single Battery Bank
- Power Sensitive Electronics
- Low Profile Case Fits in Tight Locations



Features

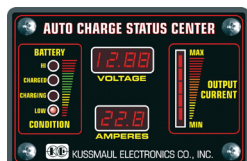
- 24Vdc, 45 Amps for charging vehicle batteries
- Light weight, small low profile size
- Clean output poses no interference with radios and other mobile devices
- Auxiliary 24Vdc, 15 Amp output circuit with power source selector switch for operating accessory loads: air compressor pumps, hand lights or handheld radios
- Front panel connections for remote display and auxiliary loads
- Designed for rigors of emergency vehicle use; heavy duty aluminum case
- Remote battery sensing output to compensate for longer charging cables



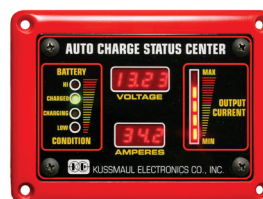
Remote Display Options



Bar Graph Display
091-200-IND



Status Center Display
091-194C-24-IND



Status Center Display
in Watertight Case
091-194C-24-ND-WT-XX

Color Options

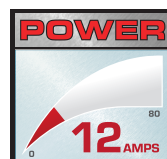
- | | |
|---------------------|---------------------|
| YW
Yellow | RD
Red |
| WH
White | GY
Gray |
| BL
Blue | BLK
Black |

Part Number	Description	Electrical Data				Dimensions			Wt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-206-24	LPC 45, w/ Bar Graph Display	12	45	120	13	13.75"	7.00"	4.09"	10
091-206-24-194C	LPC 45, w/ Status Center	12	45	120	13	13.75"	7.00"	4.09"	10
091-206-24-194C-WT-XX	LPC 45, w/ Watertight Display	12	45	120	13	13.75"	7.00"	4.09"	10

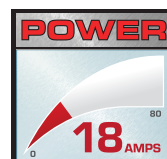
12 Vdc version available, see Page 7 for details

EURO CHARGERS - MULTIPLE BATTERY BANKS

- Charge Single, Dual or Triple Battery Banks
- 120/240V Source
- Front Panel Amp Meter



Euro Charger I



Euro Charger II



Euro Charger III



12A, Single or Dual Bank Output



18A, Triple Battery Bank



40A, Single or Dual Bank

Features

- 12, 18 and 40A, models for charging battery
- Wide variety of input/output options to meet various international applications
- Automatically charges and supports parasitic DC loads: data terminals, radios, hand lights, etc. assuring battery is ready for vehicle start
- Multiple bank output:
- Independent sense circuits control voltage and current to each battery, thus parasitic loads on one battery have no effect on the others
- Full amperage output is available to any battery if adjacent banks do not require charging
- Front panel amp meter indicates total output
- Optional LED or Bar Graph Remote Displays available
- 120/240V operation
- Meets CE requirements
- Designed for the rigors of emergency vehicle use; heavy duty aluminum case with protective front panel plate and wire strain relief

Remote Display Options



LED Display
091-90-012-12
For All Models



Single Bar Graph Display
091-94-12E
For Euro Charger I & I VHO



Dual Bar Graph Display
091-11-127-12
For Euro Charger II & II VHO



Triple Bar Graph Display
091-118-022-12
For Euro Charger III

Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-90-12	Euro Charger I	12	12	120/240	2.6/1.3	4.375"	5.50"	11.375"	12
091-90-24	Euro Charger I, 24 Volt	24	6	120/240	2.6/1.3	4.375"	5.50"	11.375"	12
091-162-12	Euro Charger I VHO	12	40	120/240	10/5	9.25"	9.375"	14.00"	33
091-162-24	Euro Charger I VHO, 24 Volt	24	20	120/240	10/5	9.25"	9.375"	14.00"	33
091-117-12	Euro Charger II	12	12	120/240	2.6/1.3	4.375"	5.50"	11.375"	17
091-117-24	Euro Charger II, 24 Volt	24	6	120/240	2.6/1.3	4.375"	5.50"	11.375"	17
091-143-12	Euro Charger II VHO	12	40	120/240	10/5	9.25"	9.375"	14.00"	39
091-143-24	Euro Charger II VHO, 24 Volt	24	20	120/240	10/5	9.25"	9.375"	14.00"	39
091-118-12	Euro Charger III	12	18	120/240	4.7/2.4	4.25"	6.75"	12.75"	19
091-118-24	Euro Charger III, 24 Volt	24	9	120/240	4.7/2.4	4.25"	6.75"	12.75"	19

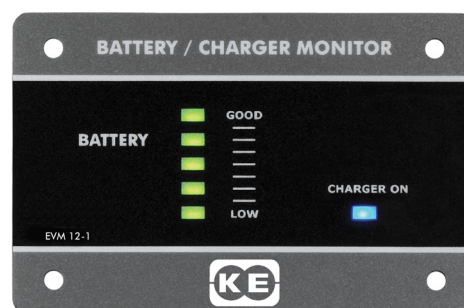
WATERPROOF CHARGER - SINGLE BATTERY BANK

- Waterproof for Exposed Locations
- Remote Display Included



Features

- 35A for charging battery
- Sealed case allows installation in exposed locations
- Frees in-cab and compartment space by allowing charge installation in areas not suitable for standard chargers
- No exposed terminals
- Rugged anodized aluminum case with integral heat sinks for cool operation
- Remote bar graph display included



Remote Bar Graph Display: 023-5353-1

- Charger On" LED
- Bar graph battery condition
- Operates when charger is not powered

Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
440-4910-0	WP-35, Waterproof Charger	12	35	120	10	5.75"	6.875"	14.00"	30

- Automatically Power Onboard Computers & MDT's When AC Line Applied to Truck
- Preserves Vehicle Battery



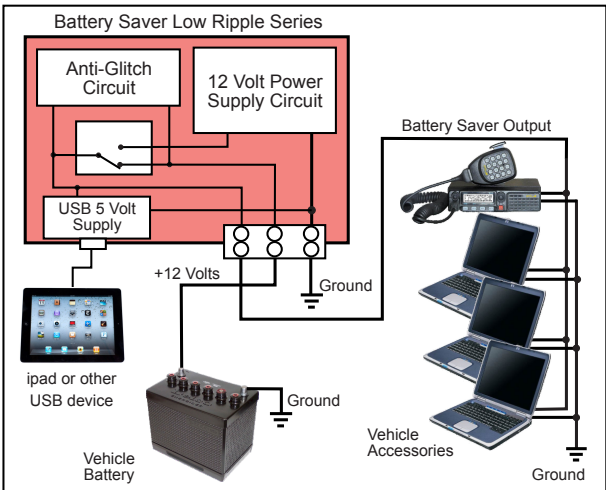
Battery Saver Low Ripple HO



Battery Saver Low Ripple HO with USB Port

Features

- 20A, 12V models
- Relay removes auxiliary loads from vehicle battery and connects to battery saver, preventing battery discharge when in station
- Clean, low ripple output causes no interference with sensitive electronics
- Fast acting relay ensures “glitch” free power transfer
- Current limiting prevents overload
- 13.2V setting or specify
- Front panel “Power On” indicator
- Designed for rigors of emergency vehicle use; heavy duty case and components
- USB Model Only:
 - Front panel USB interface used for recharging electronic devices such as the iPhone or iPad
 - 5.0V, 1A USB Output



Battery Saver Operation:
When the Battery Saver is operating, the vehicle's accessories are powered by the 12 volt power supply, internal to the unit. When the Battery Saver is powered off, a relay inside the Battery Saver switches the vehicle accessories directly to the battery. An anti-glitch circuit assures that there is no power drop during the switch over from the power supply to the battery.

Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-195-12	Battery Saver Low Ripple HO	12	20	120	4.5	2.50"	5.50"	13.00"	5
091-195-12-USB	Battery Saver Low Ripple HO, w/USB	12	20	120	4.5	2.50"	5.50"	13.00"	5

INDICATORS / METERS



Engine Monitor
VOTT
Page 27



Generator Monitor
VAAFH
Page 27



Status Center Digital
Display With Bar
Graph, Watertight
Page 28



Status Center Digital
Display With Bar
Graph, Standard
Page 28



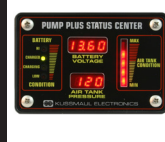
Status Center
Digital Display
Single Battery
Page 28



Status Center
Digital Display
Dual Battery
Page 28



Auto Pump Status
Center Digital Display
PSI Only
Page 28



Auto Pump Status
Center Digital Display
Voltage & PSI
Page 28



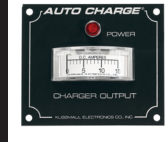
Remote Bar
Graph Displays
Single, Dual & Triple
Page 29



Watertight Bezel
For All Displays
Page 30



DC Volts &
DC Amps Displays
Page 30



DC Ammeter
IN-3-XX
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LED Display
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LED
Display
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Verical Display
Mount
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Display Panel
Rear Seal
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DC/AC Clamp
Meter
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Digital Battery
Analyzer
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TG-3:
Temperature
Display
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DCE
DC Energy Display
Page 31



DCV
Voltmeter Display
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Engine Monitor

- Digital read out of vital engine data:
- DC Voltage:
 - Oil Pressure
 - Temperature
 - Tachometer
- Audio and visual alarm for out of limit conditions Operates from J1939 can bus input

Features

- Large 4" x 4" LED display provides simultaneous read-out of vital engine operation data
- 4 level adjustment brightness settings
- Programmable alarm set points for oil, temp and voltage, and RPM
- Alarm programming via 4 button key pad
- Internal audio alarm with remote alarm output signal
- Waterproof meter face
- Input signal wire assembly with waterproof Deutsch connector.
- Panel mount: 2-1/8" hole



Part Number	Description	Electrical Data		Dimensions			Wgt.
		Input Volts	Input Signal	L	W	H	
023-4400-0	VOTT	9-33	J 1939	2.7"	4.0"	4.0"	2

Generator / AC System Monitor

- Digital read out of vital generator data:
 - AC Voltage
 - Frequency
 - Amperage of two 120V legs of 240V circuit
 - Engine hours
- Audio and visual alarm for out of limit conditions

Features

- Large 1/2" high LED digits in high visibility green
- 4 functions, all display simultaneously on one screen: Volts, Amps, Frequency
- Hour meter displays when generator is off
- Easy function and alarm programming via 4 button key pad, with on screen menu settings
- 4 level adjustable LCD brightness settings
- Programmable alarms: HIGH/LOW for volts and frequency and HIGH alarm for amps (2 lines). Alarm modes: Red warning color visual indication, plus built in 85 db audible, with output signal for external alarm relay
- User programmable service hour interval settings and notification (password protected)
- 150A Current transformers (2 X) provided
- DC powered 9-33 VDC, with low power consumption sleep mode (<20 ma) to conserve vehicle batteries
- Low profile and compact display. Size: 4" x 4"
- Panel mount: 2-1/8" hole
- Waterproof instrument face

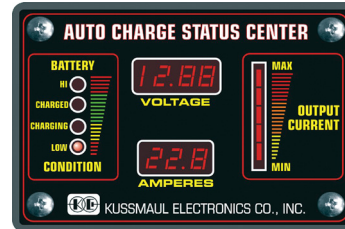


Part Number	Description	Electrical Data			Dimensions			Wgt.
		Operating Voltage	Sense Voltage	Max. Power	L	W	H	
023-4500-0	VAAFH	9-33V DC	120/240V AC	36 kW	2.7"	4.0"	4.0"	2

Status Center Digital Displays With Bar Graph



091-194X-IND-WT-XX
Watertight Heavy Duty Housing
 Size: 5.45" x 3.95"

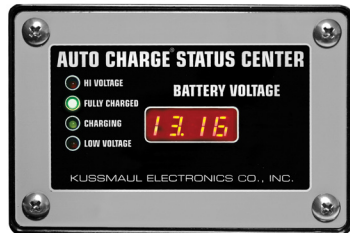


091-194X-IND
Standard Housing
 Size: 3.2" x 4.7"

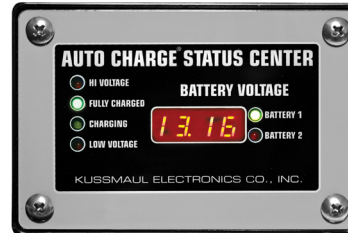
These displays provide digital voltage and amperes readout, a 5 segment bar graph indicating output current, and 4 LED's showing battery condition. They are available in two housings, standard and watertight. The watertight housing is available in multiple colors. They are compatible with: Auto Charge 1000, Auto Charge 1200, Auto Charge 1200 Remote, LPC 20, LPC 40, LPC 80, Pump Plus 1000 and Pump Plus 1200 battery chargers.

Color Options: YW WH RD GY BL BLK
 Yellow White Red Gray Blue Black

Status Center Digital Displays



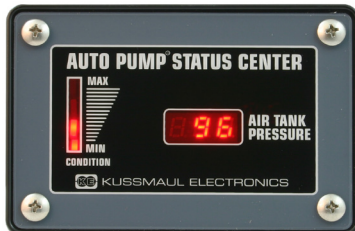
091-189-12 (1 decimal place accuracy)
091-189-12-3.5D (2 decimal place accuracy)
Single Battery Display
 Size: 3.2" x 4.7"



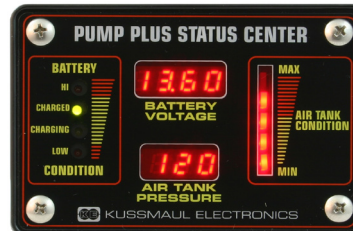
091-189-2-12 (1 decimal place accuracy)
091-189-2-12-3.5D (2 decimal place accuracy)
Dual Battery Display
 Size: 3.2" x 4.7"

These universal displays are compatible with all Kussmaul chargers and on vehicles without a charger. Displays voltage digitally, indicates battery condition via LED's: LED's flash when high or low voltage sensed. Available in 1 or 2 battery bank versions, one or two decimal accuracy, 12 or 24V system.

Auto Pump Status Center Digital Displays



091-198-12-AP
PSI Only
 Size: 3.2" x 4.7"



091-198-12-PP
Voltage & PSI
 Size: 3.2" x 4.7"

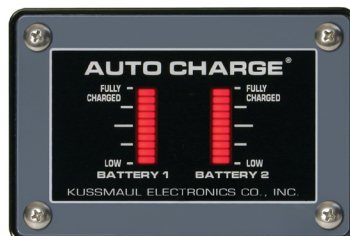
These displays are an air pressure sensor with indicator that display air pressure in PSI. The "AP" display contains a numerical display for PSI and bar graph. While the "PP" display contains a bar graph, a numerical display for PSI and a 3.5-digit display for battery voltage. They both work in conjunction with an air pressure sensor. The air pressure sensor port is connected to an air supply to measure and display the PSI. The indicator is designed to be mounted on the exterior of a vehicle so that the PSI condition may be easily viewed.

REMOTE BAR GRAPH DISPLAYS



091-94-XX

This universal single battery bank voltage display may be installed in any 12 or 24V system



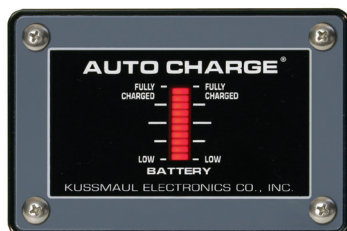
091-76-XX

This universal dual battery bank voltage display may be installed in any 12 or 24V system (negative ground only)



091-118-022-XX

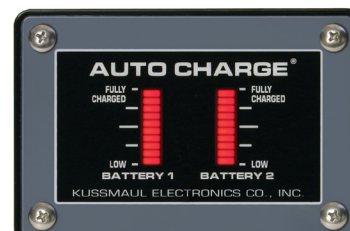
This universal three battery bank voltage display may be installed in any 12 or 24V system (negative ground only)



091-199-001

This charger specific single battery condition bar graph display is normally supplied with these chargers:

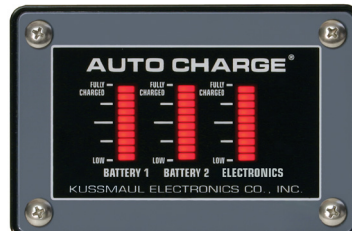
**Auto Charge 1000
Auto Charge 35/10
Auto Charge 1200 Remote
Pump Plus 1000
Pump Plus 1200**



091-39-IND

This charger specific dual bar graph battery condition display is normally supplied with these chargers:

**Auto Charge 2000
Auto Charge 4000
Pump Plus 2000**



091-74-IND

This charger specific three bank voltage display is normally supplied with:

Auto Charge D2



091-200-IND

This charger specific single battery condition bar graph display is normally supplied with these chargers:

**LPC 20
LPC 45
LPC 40
LPC 80**



091-66-IND

This charger specific dual bar graph battery condition display is labeled "Vehicle" and "Engine" and is normally supplied with these chargers:

**Auto Charge D
Auto Charge D Pump Plus**

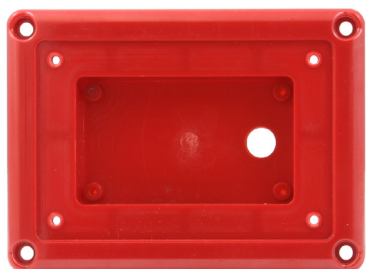


091-234

This charger specific single battery condition mini bar graph display is an option for the following chargers:

**Auto Charge 1000
Auto Charge 35/10
Auto Charge 1200 Remote
Pump Plus 1000
Pump Plus 1200**

ANALOG AND LED DISPLAYS



This watertight housing may be used with any of the remote bar graph displays, status center digital display with bar graph, status center digital displays or auto pump status center digital displays. Available in multiple colors. Please specify when ordering the display.

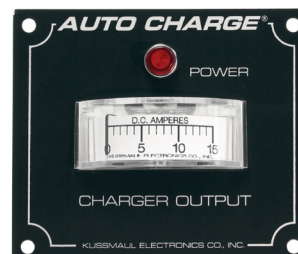


DC Volts

023-9161-0, 8-16V

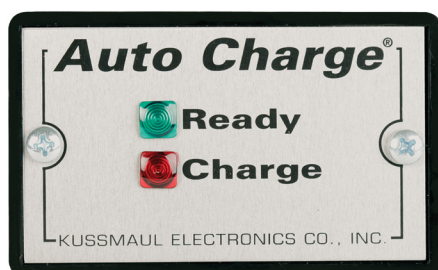
023-1632-0, 16-32V

This economical indicator is a suppressed zero voltmeter which provides an indication of 12 or 24V system voltage. 2.5" square indicator face.



IN-3-XX

Designed for use with any charger. Neon pilot light indicates when power is applied to vehicle and a DC ammeter to measure battery charger output current. Specify ammeter current (15, 20 or 25) when ordering.



IN-4

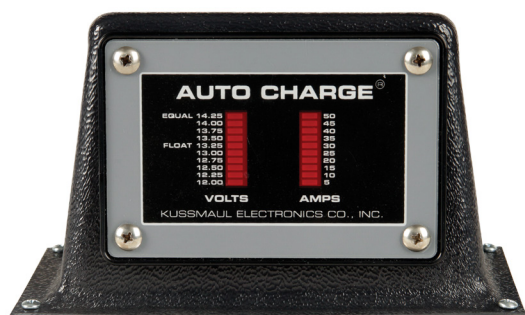
This display is for use with the Pump Plus HO Battery Charger/Air Compressor. Will not operate with other chargers.



091-11-102-12

The 091-11-102-12 Display is a remotely mounted LED battery condition display. This display is used with: **Auto Charge 12, Auto Charge 12HO, Auto Charge 11, Auto Charge 11HO, Auto Charge 20**

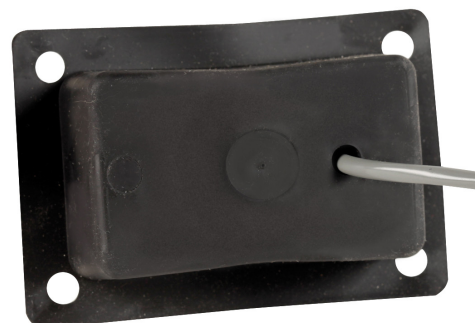
Display Installation Accessories



Vertical Display Mount

091-91-013

This is an ABS plastic housing designed specifically for any Kussmaul bar graph display. This housing lets you mount your bar graph on the dashboard or anywhere else inside your vehicle. Display sold separately.



Display Panel Rear Seal

091-39-109

Rubber watertight seal designed specifically for any Kussmaul bar graph display. This seal protects the rear of the bar graph.

TEST EQUIPMENT AND DIGITAL DISPLAYS



**DC/AC Clamp Meter
380941**

Features

- Inductive clamping jaw allows current measurement without disconnecting wiring or shunt, 0.9" opening
- Accurate data on all major DC/AC electrical functions
- convenient hand-held device
- easy-to-read LCD display
- Long easy-grip color coded needle-type test probes
- Operates on two AA batteries (provided)
- Protective carrying case included
- Measures and Displays:
 - AC Voltage up to 400V AC
 - AC/DC Current up to 200A
 - Frequency at 50-10 KHz



**TG-3: Temperature Display
023-4350-0**

Features

- Sensor range: -20 to 160° F (-29 to 71° C)
- 3 Zone input
- LCD Read out accurate within 1% +/-1 degree, full scale
- Five level back lighting "On" LED display
- Programmable high/low temperature alarm- activates 85 db warning buzzer
- Programming via instrument front buttons
- Waterproof face fits standard 2.125" instrument hole
- Includes (1) remote temperature sensor with 20' cable



**DCE: DC Energy Display
023-4346-0**

Displays volts, amps, energy used and remaining for 12 or 24V up to 500 amps and 3,000 amp-hour capacity. Monitor voltage on up to three separate banks to monitor:

1. Charge/discharge amperage
2. Total energy: amp-hours or percent-of-charge
3. Alarms: high/low voltage and low amp-hours remaining



**DBA: Digital Battery Analyzer
497-0400-5**

Features

- Analyzes 12 volt and 6 volt lead-acid batteries of all types: flooded, gel-cell or AGM; deep-cycle or gen/engine start
- Simple three step test procedure provides a comprehensive analysis of batteries in seconds
- No need to recharge batteries prior to testing; accurate results for batteries in any state of charge down to 5.5 volts
- Uses conductance sense technology; will not harm or discharge batteries
- Rugged, compact, light-weight water-resistant case; easy to use even in hard-to-access battery compartments

Specifications

Battery Type: 12 or 6 VDC nominal, lead-acid (flooded, gel or AGM), deep-cycle or gen/engine start

Battery Capacity: 100-1400 CCA

Operating Range: 5.5 - 14.0V DC

Input Power: Operates on power of battery under test, down to 5.5 VDC

Temp. Range: 32-120°F (0-50°C); temperature compensation provided below 32°F

Protection: Will not be harmed by accidental reverse polarity connection

Case Material: Acid resistant ABS plastic



**DCV: Voltmeter Display
023-4348-0**

Three battery bank digital read out for 12 and 24 volt battery systems. Includes a Hi/Low voltage alarm built-in. Wires directly to batteries, no charger connection required. Push button selection of battery bank reading.

Size: 2 1/2" Square Face, 2 1/8" Diameter Mounting Hole, 2 3/8" Rear Meter Projection

SECTION 3

CORD EJECT SYSTEMS

SECTION 3 - CORD EJECT SYSTEMS



Auto Eject WP
Page 33



Dynamic Disconnect
Page 33



Rear Enclosure
Page 33



EZ Mounting Plate
For Auto Eject WP
Page 33



Super Auto Eject
Page 34



EZ Mounting Plate
For Super Auto Eject
Page 34



Super Trailer Eject
Page 35



EZ Mounting Plate
For Trailer Eject
Page 35



Super 30 Auto Eject
Page 36



Super 30 Auto Eject -
Air / Electric
Page 37



Super 16 Auto Eject
Page 38



Air Eject /
HP Air Eject
Page 39



Weatherproof
Adapter Kit
Page 39



EZ Mounting Plate
For Air Eject
Page 39



Auto Clean
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Weatherproof
Covers
Page 40



Name Plates
Page 40



Wire & Wiring Kits
Page 41



Receptacles
Page 41



Connectors
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WPR-1
Page 41

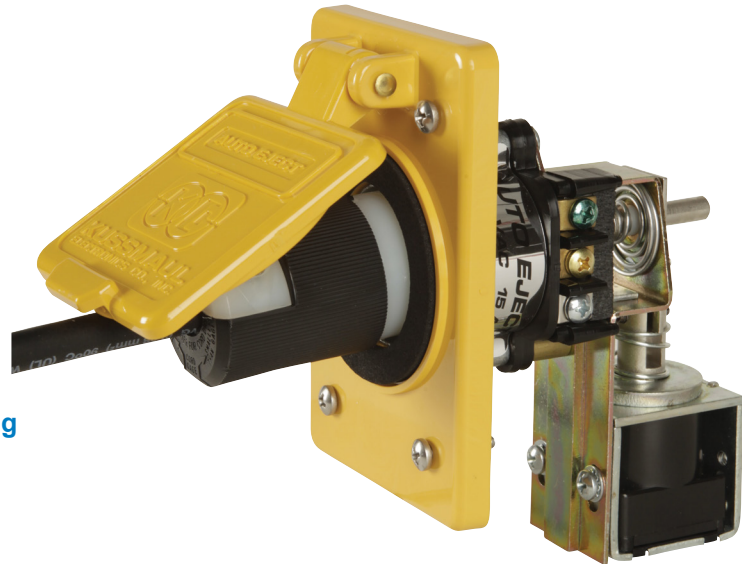
AUTO EJECT WP

Eject Plugs from Shore Power on Engine Start



Features

- 15 or 20A AC, or 15A DC receptacle
- Upon sensing engine start, plug ejects from receptacle and away from vehicle path; eliminating dangerous severing of cord
- After eject, weatherproof cover snaps into position over inlet
- 3.4" rear projection installs in vehicle side walls with limited depth clearance
- 6 cover color options



System includes: Auto-Eject, Cover and Plug

Optional Accessories



Dynamic Disconnect
091-18-098

Dynamic Disconnect:

Sequences energizing of Auto Eject eliminating terminal arcing when connecting and disconnecting



Rear Enclosure
091-18CP

Rear Enclosure:

For installations that expose rear of Auto Eject to dirt and debris



EZ Mounting Plate with Power Indicator
091-185-010

EZ Mounting Plate with Power Indicator:

Assemble and pre-wire Auto-Eject in this stainless steel plate, then mount to vehicle wall. Green indicator light confirms inlet is energized

Wiring Accessories:

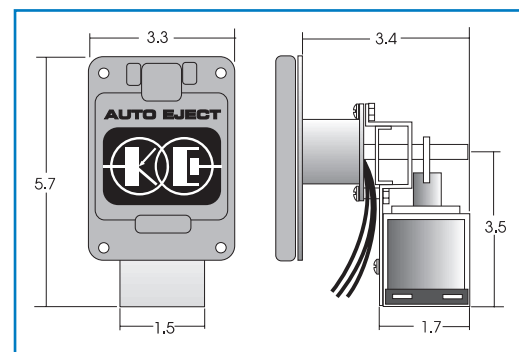
Retractable Cord, Wiring Kits, and Rubber Plug Protectors (See page 41)



Weatherproof Cover Color Options



Auto Eject WP Dimensions

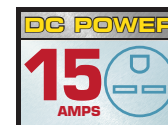


Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-18WP-120	WP Auto Eject	12	N/A	120	15	3.40"	3.30"	5.70"	2
091-20WP-120	WP Auto Eject	12	N/A	120	20	3.40"	3.30"	5.70"	2
091-18WP-012	WP Auto Eject (12V/240V)	12	15	240	15	3.40"	3.30"	5.70"	2

When ordering specify: Cover color code • 24V for 24 volt actuator operation

SUPER AUTO EJECT

• Eject Plugs from Shore Power On Engine Start



Features

- 15 or 20A AC, or 15A DC receptacle
- Upon sensing engine start, plug ejects from receptacle and away from vehicle path; eliminating dangerous severing of cord
- Sense circuit sequences energizing of Auto Eject eliminating terminal arcing when connecting and disconnecting
- After eject, weatherproof cover snaps into position over inlet
- Weatherproof back enclosure with watertight cable fittings protects mechanism from road contamination
- Pre-wired with 3' AC cord and eject sense wire, side entry standard, back entry option

System includes: Auto-Eject, Cover, Plug, and pre-wired with 3' AC power and Eject Sense Wire



Optional Accessories

EZ Mounting Plate with Power Indicator:

Assemble and pre-wire Auto-Eject in this stainless steel plate, then mount to vehicle wall. Watertight green indicator light confirms vehicle is energized



EZ Mounting Plate with Power Indicator
091-185-009



Weatherproof Cover Color Options

YW Yellow	RD Red
WH White	GY Gray
BL Blue	BLK Black

Other Accessories:

Retractable Cord, Wiring Kits, and Rubber Plug Protectors (see page 41)

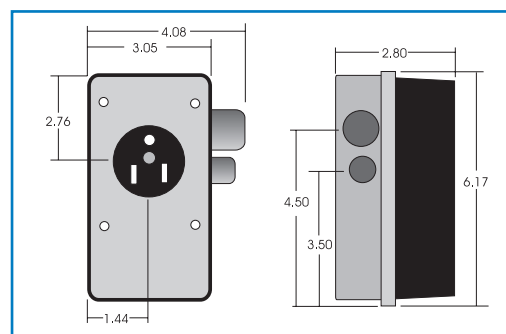
Optional Configuration

Back Wire:

For installations with rear rather than side wire orientation, specify BW when ordering



Super Auto Eject Dimensions



Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-55-15-120	Super 15 Auto Eject	12	N/A	120	15	2.80"	4.08"	6.17"	4
091-55-20-120	Super 20 Auto Eject	12	N/A	120	20	2.80"	4.08"	6.17"	4
091-55-15-DC	Super 15 Auto Eject - DC	12	15	240	15	2.80"	4.08"	6.17"	4

When ordering specify: Cover color code • BW for back wire option • 24V for 24 volt actuator operation

SUPER TRAILER EJECT

- Eject Plug from Trailer Shore Power Upon Depressing Brake Pedal



Features

- 15 or 20A AC, or 15A DC receptacle
- Plug eject mechanism wires to foot brake pedal, dislodging plug prior to vehicle being put in gear
- Upon depressing vehicle brake pedal, plug ejects from receptacle and away from trailers path
- Sense circuit sequences energizing of Auto Eject eliminating terminal arcing when connecting and disconnecting
- After eject, weatherproof cover snaps into position over inlet
- Weatherproof back enclosure with watertight cable fittings protects mechanism from road contamination
- Pre-wired with 3' AC cord and eject sense wire, side case entry standard, back case entry optional



System includes: Auto-Eject, Cover, Plug, and pre-wired with 3' AC power and Eject Sense Wire

Optional Accessories

EZ Mounting Plate with Power Indicator:

Assemble and pre-wire Auto-Eject in this stainless steel plate, then mount to vehicle wall. Watertight green indicator light confirms vehicle is energized



EZ Mounting Plate with Power Indicator
091-185-009



Weatherproof Cover Color Options

YW Yellow	RD Red
WH White	GY Gray
BL Blue	BLK Black

Other Accessories:

Retractable Cord, Wiring Kits, and Rubber Plug Protectors (See page 41)

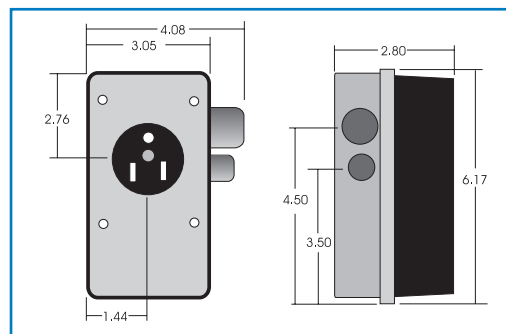
Optional Configuration

Back Wire:

Pre-wired for installations with rear rather than side wire mount, specify BW when ordering



Super Trailer Eject Dimensions



Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-55-15-120T	Super 15 Trailer Eject	12	N/A	120	15	2.80"	4.08"	6.17"	4
091-55-20-120T	Super 20 Trailer Eject	12	N/A	120	20	2.80"	4.08"	6.17"	4
091-55-15-DCT	Super 15 Trailer Eject - DC	12	15	240	15	2.80"	4.08"	6.17"	4

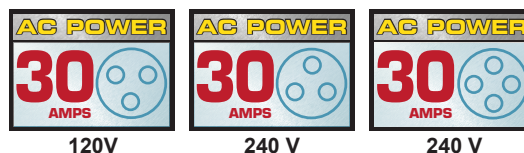
When ordering specify: Cover color code • BW for back wire option • 24V for 24 volt actuator operation

SUPER 30 AUTO EJECT

• Eject 30 Amp Plugs from Shore Power On Engine Start

Features

- 30A, heavy duty pin and sleeve contacts provide reliable connection over years of insertion/eject cycles
- 3 pin and 4 pin 120/240V configurations
- Smooth sculpted cover, no sharp edges
- Upon sensing engine start, plug ejects from receptacle and away from vehicle path; eliminating dangerous severing of cord
- Auto Eject energizing is delayed until detector pin senses plug is inserted, eliminating terminal arcing
- After eject, weatherproof cover snaps into position over inlet
- Weatherproof back enclosure with watertight cable fittings protects mechanism from road contamination



System includes: Auto-Eject, Cover and Plug



30A, 120V Plug
091-159-CON-3P-120



30A, 240V Plug
091-159-CON-3P-250



Weatherproof Cover Color Options

YW Yellow	RD Red
WH White	GY Gray
BL Blue	BLK Black

Optional Accessory

EZ Mounting Plate with Power Indicator:

Assemble and pre-wire Auto-Eject in this stainless steel plate, then mount to vehicle wall. Watertight green indicator light confirms vehicle is energized

Model # 091-159-081-120, 120 Vac

Model # 091-159-081-240, 240 Vac



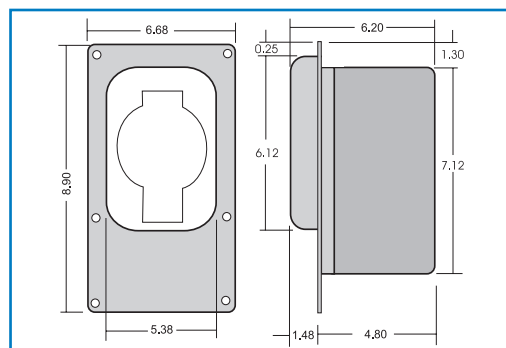
Optional Configuration

Back Wire:

For installations with rear rather than side wire orientation



Super 30 Auto Eject Dimensions



Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-159-30-120	Super 30 Auto Eject - 3 Pin	12 / 24	1.6	120	30	6.20"	6.68"	8.90"	8
091-159-30-250	Super 30 Auto Eject - 3 Pin	12 / 24	1.6	240	30	6.20"	6.68"	8.90"	8
091-159-430-250	Super 30 Auto Eject - 4 Pin	12 / 24	1.6	240	30	6.20"	6.68"	8.90"	8

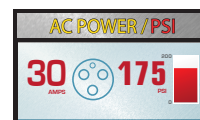
When ordering specify: Cover color code • BW for back wire option

SUPER 30 AUTO EJECT - AIR / ELECTRIC

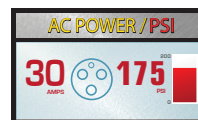
• Eject 30 Amp Plugs from Shore Power & Air Line On Engine Start

Features

- 30A, 120V, 175PSI
- Heavy duty pin and sleeve contacts provide reliable connection over years of insertion/eject cycles
- Air connection made through a brass fitting containing a shut-off valve
 - Shut-off valve opens when plug is inserted to supply air pressure to the vehicle
 - Shut-off valve closes automatically when plug is ejected sealing off the air supply air
- Upon sensing engine start, the plug ejects from receptacle and away from vehicle path; eliminating dangerous severing of cord
- Air-Electric energizing is delayed until detector pin senses plug is inserted, eliminating terminal arcing
- After eject, weatherproof cover snaps into position over inlet
- Smooth sculpted cover, no sharp edges
- Weatherproof back enclosure with watertight cable fittings protects mechanism from road contamination



120V, 30A, 175PSI



240V, 30A 175PSI



System includes: Air/Electric Auto-Eject, Cover, Plug and 30' of Air Line



30A, 120V, 175 PSI Plug
091-169-CON-4P-120



30A, 240V, 175 PSI Plug
091-169-CON-4P-250



**Weatherproof
Cover Color Options**

YW Yellow	RD Red
WH White	GY Gray
BL Blue	BLK Black

Optional Accessory

EZ Mounting Plate with Power Indicator:

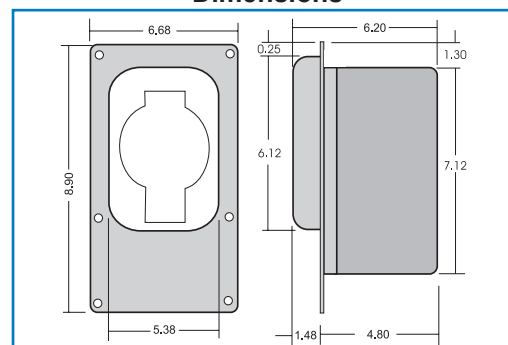
Assemble and pre-wire Auto-Eject in this stainless steel plate, then mount to vehicle wall. Watertight green indicator light confirms vehicle is energized

Model # 091-159-081-120, 120 Vac

Model # 091-159-081-240, 240 Vac



Super 30 Auto Eject - Air / Electric Dimensions



Part Number	Description	Electrical Data					Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	Max PSI	L	W	H	
091-169-30-120	Super 30 Air-Electric Auto Eject	12 / 24	1.6	120	30	175	6.20"	6.68"	8.90"	8
091-169-30-250	Super 30 Air-Electric Auto Eject	12 / 24	1.6	240	30	175	6.20"	6.68"	8.90"	8

When ordering specify: Cover color code

SUPER 16 AUTO EJECT - EURO STYLE

• Eject European Configuration 16 Amp Plugs from Shore Power On Engine Start



240V

Features

- 16A, heavy duty pin and sleeve contacts provide reliable connection over years of insertion/eject cycles
- 3 pin, 240V configuration
- IEC 60309 standard European connector provided
- 12 or 24V actuation voltages
- Smooth sculpted cover, no sharp edges
- Upon sensing engine start, plug ejects from receptacle and away from vehicle path; eliminating dangerous severing of cord
- Auto Eject energizing is delayed until detector pin senses plug is inserted, eliminating terminal arcing
- After eject, magnetized weatherproof cover snaps into position over inlet
- Weatherproof back enclosure with watertight cable fittings protects mechanism from road contamination



System includes: Auto-Eject, Cover and Plug



16A, 240V Plug
091-182-CON-3P-230



Weatherproof Cover Color Options

YW Yellow	RD Red
WH White	GY Gray
BL Blue	BLK Black

Optional Accessory

EZ Mounting Plate with Power Indicator:

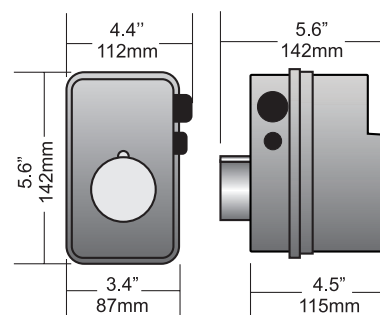
Assemble and pre-wire Auto-Eject in this stainless steel plate, then mount to vehicle wall. Watertight green indicator light confirms vehicle is energized

Model # 091-182-027-120, 120 Vac

Model # 091-182-027-240, 240 Vac



Super 16 Auto Eject Dimensions



Part Number	Description	Electrical Data Specs				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-182-230-12	Super 16 Auto Eject	12	N/A	240	16	5.60"	4.40"	5.60"	5
091-182-230-24	Super 16 Auto Eject (24V)	24	N/A	240	16	5.60"	4.40"	5.60"	5

When ordering specify: Cover color code

AIR EJECTS

• Eject Air Line From Vehicle Upon Engine Start

Features

- 140 and 175 PSI models
- Truck side mount pneumatic connector accepts standard air hose adapters to maintain pressure on vehicle brake system when in station
- Upon engine start coupler disconnects and ejects air line, preventing hazardous and damaging drive-off with hose connected
- Minimum 20 PSI required for eject

System includes: Air Eject & Mating Connector

Optional Accessories

Weatherproof Adapter Kit:

Recess mounting bracket with weatherproof cover with choice of six color options

Model #: 091-28AK-XX



Weatherproof Adapter Kit

EZ Mounting Plate with 'Connected' Indicator:

Simplifies installation with indicator light confirming proper connection

Model #: 091-185-011



EZ Mounting Plate with Power Indicator

Auto Clean:

Air filter removes contaminants from line. Paper roll filter element

Model #: 091-9G-2



Auto Clean



Weatherproof Cover Color Options

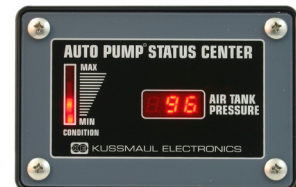
YW Yellow	RD Red
WH White	GY Gray
BL Blue	BLK Black

Auto Pump Status Center:

This display is an air pressure sensor with indicator that displays air pressure in PSI. The display contains a numerical display for PSI and bar graph. Works in conjunction with an air pressure sensor.

The air pressure sensor port is connected to an air supply to measure and display the PSI. The indicator is designed to be mounted on the exterior of a vehicle so that the PSI condition may be easily viewed.

Model #: 091-198-12-AP



Part Number	Description	Electrical Data			Dimensions			Wgt.
		DC Volts	DC Amps	Maximum PSI	L	W	H	
091-28	Air Eject	12	N/A	140	1.70"	2.85"	3.60"	2
091-28-24	Air Eject (24V)	24	N/A	140	1.70"	2.85"	3.60"	2
091-28HP	HP Air Eject	12	N/A	175	1.70"	2.85"	3.60"	2
091-28HP-24	HP Air Eject (24V)	24	N/A	175	1.70"	2.85"	3.60"	2

COVERS AND NAME PLATES

Weatherproof Covers



091-3XX

Used with:

- WP Auto Eject
- Wiring Kits
- Receptacles



091-55XX

Used with:

- Super 15 & 20 Auto Eject
- Air Eject WP Adapter Kit



091-182XX

Used with:

- Super 16 Auto Eject



091-159XX

Used with:

- Super 30 Auto Eject
- Super 30 Auto Eject - AE

Use With	Model
Auto Eject WP	091-3XX (add suffix color code)
Super Auto Eject 15, 20	091-55XX (add suffix color code)
Super 16 Auto Eject	091-182XX (add suffix color code)
Super 30 Auto Eject	091-159XX (add suffix color code)

Color Options

YW Yellow	RD Red	BL Blue
WH White	GY Gray	BLK Black

Add suffix color code to model # when ordering

Nameplates

Self adhesive nameplates fit in recess on Auto Eject weatherproof covers

Ordering Information		
Model	Nameplate	Type of Cover
091-NP-01	Air Eject	091-3XX
091-NP-02	Air Compressor	091-3XX
091-NP-03	Battery Charger	091-3XX
091-NP-04	Block Heater	091-3XX
091-NP-05	Battery Charger, Block Heater	091-3XX
091-NP-06	Battery Charger, Air Compressor	091-3XX
091-NP-07	Batt. Chgr., Air Comp., B. Heater	091-3XX
091-NP-Kit	All Nameplates	091-3XX
091-55NP-01	Air Ejects	091-55XX
091-55NP-02	Air Compressor	091-55XX
091-55NP-03	Battery Charger	091-55XX
091-55NP-04	Block Heater	091-55XX
091-55NP-05	Battery Charger, Block Heater	091-55XX
091-55NP-06	Battery Charger, Air Compressor	091-55XX
091-55NP-07	Batt. Chgr., Air Comp., B. Heater	091-55XX
091-55NP-Kit	All Nameplates	091-55XX



091-55XX



091-3XX

AIR EJECT
AIR LINE DISCONNECT

AIR COMPRESSOR
120 VOLT A.C. INPUT

BATTERY CHARGER
120 VOLT A.C. INPUT

BLOCK HEATER
120 VOLT A.C. INPUT

**BATTERY CHARGER
BLOCK HEATER**
120 VOLT A.C. INPUT

**BATTERY CHARGER
AIR COMPRESSOR**
120 VOLT A.C. INPUT

**BATTERY CHARGER
AIR COMPRESSOR
BLOCK HEATER**
120 VOLT A.C. INPUT

WIRING ACCESSORIES AND KITS

Wiring Kits



- 30', 3 conductor wire
- Receptacle & weatherproof cover (Choice of Color)
- Plug

Description		Model
15A AC, 14 AWG		VW-7
20A AC, 12 AWG		VW-9
15A DC, 14 AWG		VW-8

Wiring Accessories



- 30', 3 conductor wire
- Male receptacle

Description		Model
15A, AC, 14AWG		VW-4
20A, AC, 12 AWG		VW-5
15A, DC, 14 AWG		VW-2

Wire



- 30', 3 conductor wire

Description	Model
15A, AC, 14 AWG	VW-3
20A, AC, 12 AWG	VW-6

Retractable Cord



Description	Model
15A, 14 AWG, 3 Cond, 20'	091-18D-14
20A, 12 AWG, 3 Cond, 20'	091-18D-12

Receptacles



Description	Model	
15A, 120V AC	5278C	
20A, 120V AC	5378C	
15A, 12V DC	5678C	

Connectors



Description	Model	
15A, 120V AC	5-15P-H	
20A, 120V AC	5-20P-H	
15A, 12V DC	6-15P-H	

Connector Protector



Rubber Jacket fits over cord connectors, 1/8" wall thickness, protects against damage when connector drops to floor.

Model 091-55-069

DC Connector



This 3 conductor, 12V, 15A, twist lock connector is moisture resistant and provides a connection that cannot be accidentally interchanged with any of the standard AC connectors. Ideally suited for coupling DC to portable equipment. **Model 091-3-157**

AC Connector

This kit contains a 20A, 120V power input receptacle, weatherproof cover, plastic water tight enclosure and a liquid tight connector for wire diameter 0.170 minimum to 0.470 maximum.

Model WPR-1-XX



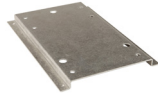
(Specify Color)

YW	WH	RD	GY	BL	BLK
Yellow	White	Red	Gray	Blue	Black

AIR COMPRESSORS



Auto Pump Timers
Page 43



Vibration Dampening
Mounting Plates
Page 43



Auto Clean
Page 43



Auto Pump Tester
Page 43



Auto Drains
Page 43



Auto Pump 12 V
Page 44



Auto Pump 12 V HP
Page 45



Auto Pump AC
Page 46



Auto Pump HP
Page 47



Auto Pump Timer

The Auto Pump Timer cycles power to the air compressor on a 1 hour "On" / "Off" interval, conserving batteries, allowing pump cooling, and extending component life. Indicator light activates when Pump is in 'Off' mode



Vibration Dampening Mounting Plate

Simplifies installation and provides vibration dampening shock mounts pressed on to plate at pump mounting points



Auto Clean, Filter Moisture Separator & Manual Drain

Micron filter element removes particulates from line and extracts moisture into collector bowl with manual drain valve. Installs in Auto Pump output line 0.25" NPT female

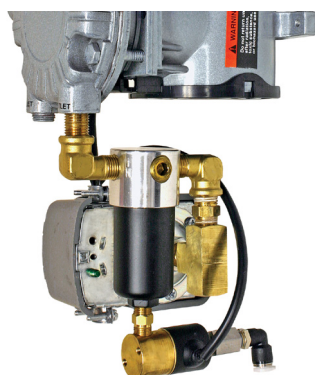


Auto Pump Tester

The Auto Pump Tester is a 1/2 gallon tank with a pressure gauge, bleed valve and air line that acts as a reservoir. The unit is for testing Auto Pumps in the field. The system is designed to simulate a vehicle's air system

Filter/Moisture Separation With Automatic Drain

These kits contain all components required for installation of a water separator AUTO PUMP air compressors. A normally open solenoid valve drains the moisture from the separator collector bowl each time the compressor shuts down. Easily installed on any AUTO PUMP, the AUTO DRAIN assures the filter bowl is always drained and eliminates manual draining chores for maintenance personnel. The AUTO DRAIN is available as a retrofit component or pre-installed on the AUTO PUMP



091-9-131

Fits the 091-9-12V
Auto Pump 12V



091-9-089

Fits the 091-9B-1
Auto Pump AC



091-9-090

Fits the 091-9HP
Auto Pump HP

Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-150	Auto Pump Timer (12V DC)	12	N/A	N/A	N/A	N/A	N/A	N/A	0.5
091-150-115	Auto Pump Timer (120V AC)	N/A	N/A	120	N/A	N/A	N/A	N/A	0.5
091-9-12V-HP-H	Mounting Plate - 12V & 12VHP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.2
091-9H-1	Mounting Plate - B1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.2
091-9HP-H	Mounting Plate - HP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.2
091-9G	Auto Clean, 12V	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.2
091-9G-B1	Auto Clean, B1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.2
091-205	Auto Pump Tester	N/A	N/A	N/A	N/A	7.5	7.5	10.0	9.0
091-9-131	Auto-Drain - 12V	12	N/A	N/A	N/A	N/A	N/A	N/A	1.0
091-9-089	Auto-Drain - B1	N/A	N/A	120	N/A	N/A	N/A	N/A	1.0
091-9-090	Auto-Drain - HP	N/A	N/A	120	N/A	N/A	N/A	N/A	1.0

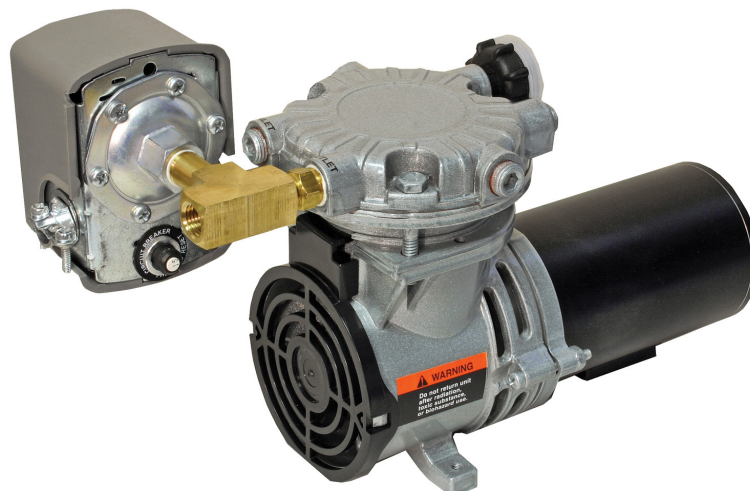
AUTO PUMP® 12V, 100 PSI

- Maintains Air Brake System Pressure
- Compensates for System Leaks
- 100 PSI



Features

- 100 PSI Max Rating
- Vehicle mount compressor ensures truck air brake system is properly pressurized for immediate dispatch from station
- Pressure switch regulated operation automatically senses low pressure in air system and restores proper pressure, preventing brake lock-up
- Factory set PSI actuation points: 75 "On", 95 "Off"
- Adjustment differential 20 PSI, 100 PSI max
- Output: 0.30 SCFM @ 80 PSI, 0.35 SCFM @ 60 PSI
- 12V, 11A
- No interference with engine mounted air compressor
- Sealed ball bearings for long service life
- Compact size
- 15A circuit breaker installed in pressure switch



Optional Accessories

Auto Clean:

Micron filter element removes particulates from line and extracts moisture into collector bowl with manual drain valve. Installs in Auto Pump output line 0.25" NPT female.

Model #: 091-9G



Auto Drain:

Automatically purges water separator bowl every time compressor cycles off via a 12V solenoid. Eliminates manual draining chore for maintenance personnel. Available as retrofit accessory or order pre-installed on Auto Pump.

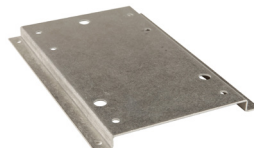
Model #: 091-9-131



Vibration Dampening Mounting Plate:

Simplifies installation and provides vibration dampening shock mounts pressed into plate at pump mounting points.

Model #: 091-9-12V-HP-H

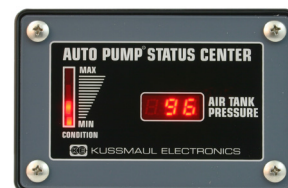


Auto Pump Status Center:

This display is an air pressure sensor with indicator that displays air pressure in PSI. The display contains a numerical display for PSI and bar graph. Works in conjunction with an air pressure sensor.

The air pressure sensor port is connected to an air supply to measure and display the PSI. The indicator is designed to be mounted on the exterior of a vehicle so that the PSI condition may be easily viewed.

Model #: 091-198-12-AP



Auto Pump Timer:

Cycles power to the compressor on a 1 hour "On"/"Off" interval, conserving batteries, allowing pump cooling, and extending component life. Indicator light activates when Pump is in 'Off' mode. **Model #: 091-150**



Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-9-12V	Auto Pump 12V	12	11	N/A	N/A	12.00"	6.60"	7.30"	6
091-9-12V-AD	Auto Pump 12V - Auto Drain	12	11	N/A	N/A	12.00"	6.60"	7.30"	6

AUTO PUMP® 12V HP, 125 PSI

- Maintains Air Brake System Pressure
- Compensates for System Leaks
- Auto Drain System Built-in
- 125 PSI



Features

- 125 PSI Max Rating
- Vehicle mount compressor ensures air brake system is properly pressurized for immediate truck departure from station
- Pressure switch regulated operation automatically senses low pressure in air system and restores proper pressure, preventing brake lock-up
- Factory set PSI actuation points: 105 on, 125 off
- Adjustment differential 20 PSI, 125 PSI max.
- Pressure gauge provides system status
- Output: 0.30 SCFM @ 80PSI, 0.35 SCFM @ 60PSI
- 12V, 11A
- No interference with engine mounted air compressor
- Sealed ball bearings for long service life
- Compact size, vertical or horizontal model configurations
- Auto Drain Built-in: Automatically purges water separator bowl every time compressor cycles off. Eliminates manual draining chore for maintenance personnel
- 15A circuit breaker installed in pressure switch



AIR COMPRESSORS

Optional Accessories

Auto Pump Timer:

Cycles power to the compressor on a 1 hour "On"/"Off" interval, conserving batteries, allowing pump cooling, and extending component life. Indicator light activates when Pump is in 'Off' mode.

Model #: 091-150



Vibration Dampening Mounting Plate:

Simplifies installation and provides vibration dampening shock mounts pressed on to plate at pump mounting points.

Model #: 091-9-12V-HP-H

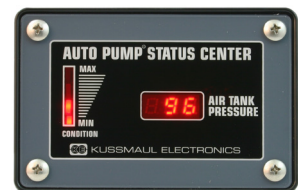


Auto Pump Status Center:

This display is an air pressure sensor with indicator that displays air pressure in PSI. The display contains a numerical display for PSI and bar graph.

Works in conjunction with an air pressure sensor. The air pressure sensor port is connected to an air supply to measure and display the PSI. The indicator is designed to be mounted on the exterior of a vehicle so that the PSI condition may be easily viewed.

Model #: 091-198-12-AP



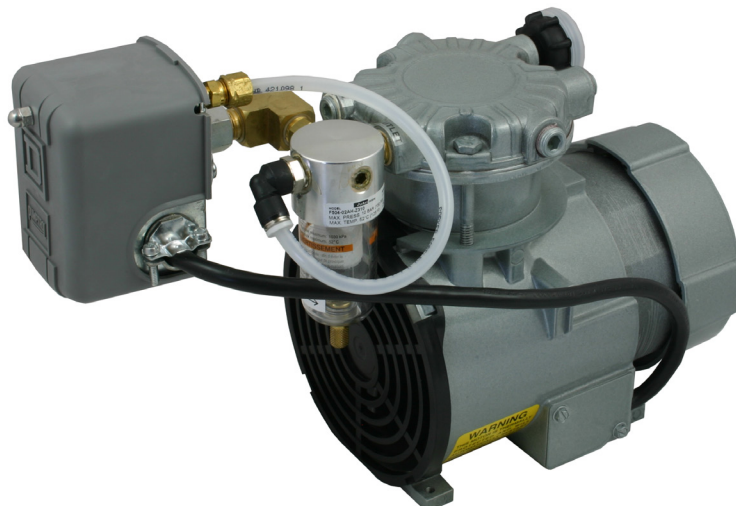
Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-9-12V-HP-HOR	Auto Pump 12V HP - Horizontal	12	11	N/A	N/A	13.7"	6.6"	7.3"	6
091-9-12V-HP-VER	Auto Pump 12V HP - Vertical	12	11	N/A	N/A	13.7"	6.6"	7.3"	6

- Maintains Air Brake System Pressure
- Compensates for System Leaks
- 100 PSI



Features

- 100 PSI Max Rating
- Vehicle mount compressor ensures air brake system is properly pressurized for immediate truck departure from station
- Pressure switch regulated operation automatically senses low pressure in air system and restores proper pressure, preventing brake lock-up
 - Pressure switch regulated operation
 - Factory set PSI actuation points: 75 on, 95 off
- Adjustable, 20 PSI differential, 100 PSI max.
- 120V, 4A, AC operation
- No interference with engine mounted air compressor
- Sealed ball bearings for long service life



Optional Accessories

Auto Drain:

Automatically purges water separator bowl every time compressor cycles off via a normally open solenoid. Eliminates manual draining chore for maintenance personnel. Available as retrofit accessory or order pre-installed on Auto Pump.

Model #: 091-9-089



Auto Pump Timer:

Cycles power to the compressor on a 1 hour "On"/"Off" interval, conserving batteries, allowing pump cooling, and extending component life. Indicator light activates when Pump is in 'Off' mode. Note: Pump Timer will only work if there is an Auto Drain installed on the pump.

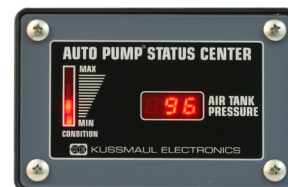
Model #: 091-150-115



Auto Pump Status Center:

This display is an air pressure sensor with indicator that displays air pressure in PSI. The display contains a numerical display for PSI and bar graph. Works in conjunction with an air pressure sensor. The air pressure sensor port is connected to an air supply to measure and display the PSI. The indicator is designed to be mounted on the exterior of a vehicle so that the PSI condition may be easily viewed.

Model #: 091-198-12-AP



Vibration Dampening Mounting Plate:

Simplifies installation and provides vibration dampening shock mounts pressed on to plate at pump mounting points.

Model #: 091-9H-1



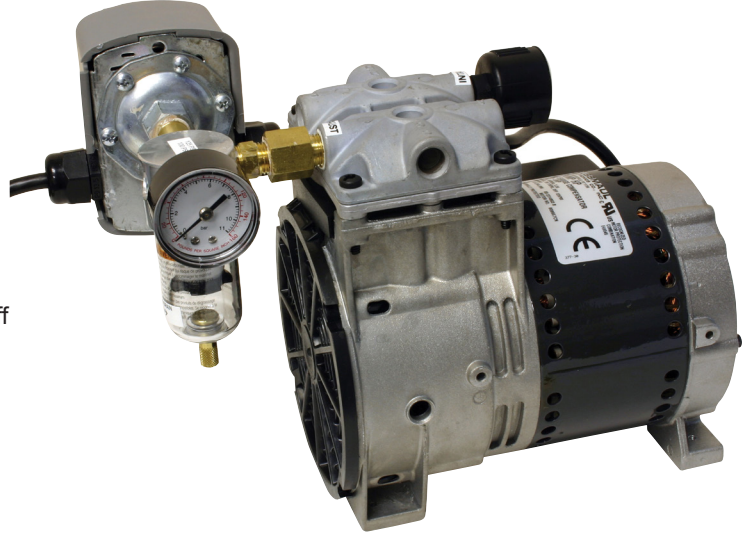
Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-9B-1	Auto Pump AC	N/A	N/A	120	4.2	7.44"	5.31"	7.78"	16
091-9B-1-AD	Auto Pump AC - Auto Drain	N/A	N/A	120	4.2	7.44"	5.31"	7.78"	16
091-9B-220	Auto Pump AC (240V)	N/A	N/A	240	2.1	7.44"	5.31"	7.78"	16

- Maintains Air Brake System Pressure
- Compensates for System Leaks
- 125 PSI



Features

- 125 PSI Max Rating
- Vehicle mount compressor ensures air brake system is properly pressurized for immediate truck departure from station
- Pressure switch regulated operation automatically senses low pressure in air system and restores proper pressure, preventing brake lock-up
 - Factory set actuation points: 105 on, 125 off
 - Adjustable, 20 PSI differential, 125 PSI max.
- 120V, 3.5A AC operation, (240 Volt model available)
- Pressure gauge provides system status
- No interference with engine mounted air compressor
- Sealed ball bearings for long service life



Optional Accessories

Auto Drain:

Automatically purges water separator bowl every time compressor cycles off via a normally open solenoid. Eliminates manual draining chore by maintenance personnel. Available as retrofit accessory or order pre-installed on Auto Pump.

Model #: 091-9-090



Auto Pump Timer:

Cycles power to the compressor on a 1 hour "On"/"Off" interval, conserving batteries, allowing pump cooling, and extending component life. Indicator light activates when Pump is in 'Off' mode.

Model #: 091-150-115

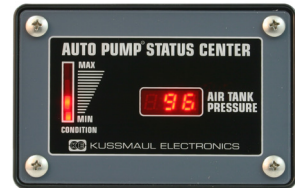


Auto Pump Status Center:

This display is an air pressure sensor with indicator that displays air pressure in PSI. The display contains a numerical display for PSI and bar graph.

Works in conjunction with an air pressure sensor. The air pressure sensor port is connected to an air supply to measure and display the PSI. The indicator is designed to be mounted on the exterior of a vehicle so that the PSI condition may be easily viewed.

Model #: 091-198-12-AP



Vibration Dampening Mounting Plate:

Simplifies installation and provides vibration dampening shock mounts pressed on to plate at pump mounting points.

Model #: 091-9HP-H



Part Number	Description	Electrical Data Specs				Dimensions			Wgt
		DC Volts	DC Amps	AC Volts	AC Amps	H	W	D	
091-9HP	Auto Pump HP	N/A	N/A	120	3.5	9.25"	7.50"	7.50"	13
091-9HP-AD	Auto Pump HP - Auto Drain	N/A	N/A	120	3.5	9.25"	7.50"	7.50"	13
091-9HP-220	Auto Pump HP (240V)	N/A	N/A	240	1.7	9.25"	7.50"	7.50"	13

SECTION 5

KITS AND PACKAGES



Pump Plus 1000
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Pump Plus 1200
Page 50



Pump Plus 2000
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Pump Plus HO
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Pump Plus
Auto Charge D
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Pumps Plus,
Auto Eject Kits
Page 54



Charger,
Auto Eject Kits
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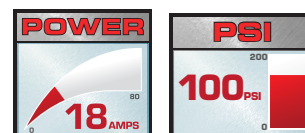
Charger,
Auto Pump AC Kits
Page 56



Charger,
Auto Pump AC,
Auto Eject Kits
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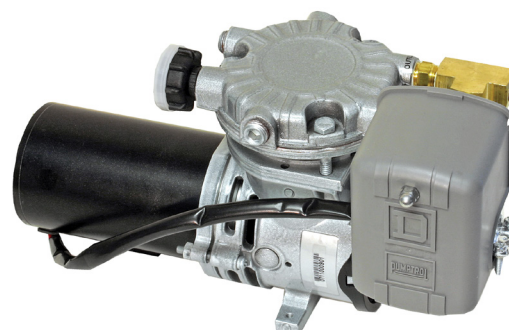
PUMP PLUS 1000 SYSTEM

- **Integrated Package: Charger, Compressor with Battery Saver & Remote Display**
- **System Components Maintain Air Brake Pressure, Batteries, and Power Auxiliary Loads**



Features

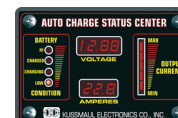
- Convenient system approach simplifies installation and wiring integration. Includes: Pump Plus 1000 and Auto Pump 12V
 - 100 PSI Max, 12V, air compressor "Auto Pump", see page 44 for specs and page 43 for optional accessories
 - Model Pump Plus 1000 charger, 18A total, single battery 15A with 3A battery saver
 - Automatic operation regulates output to a single battery bank
 - A patented built-in sense circuit checks battery voltage 120 times per second to compensate for voltage drop in charging wires providing quick re-charge, with no overcharge
 - Separate "Battery Saver" output eliminates drain on vehicle battery when in station:
 - Automatically disconnects auxiliary vehicle loads from battery when charger is energized
 - Ideal for charging hand lights and portable radios
 - 3A output with automatic overload current limit
 - Not recommended for powering highly sensitive electronic loads
- Choice of Remote Display: Bar Graph, Status Center, or Status Center in watertight case
- Air Compressor power mode selector switch
 - DC Powered full time from vehicle battery
 - AC Powered only when from battery when vehicle plugged into shore power
- Automatically shuts off compressor when disconnected from shore power, taking 12A load off vehicle batteries



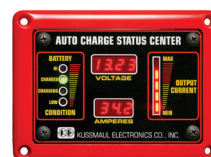
Remote Display Options



Bar Graph Display
091-199-001



Status Center Display
091-194A-IND



Status Center Display
in Watertight Case
091-194A-IND-WT-XX

Color Options

YW	RD
Yellow	Red
WH	GY
White	Gray
BL	BLK
Blue	Black

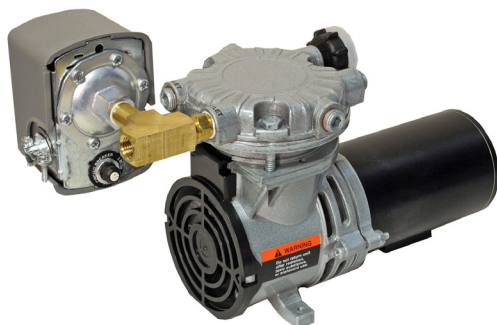
Part Number	Description
51-21-1100	Pump Plus 1000 System with Bar Graph Display
51-21-3100	Pump Plus 1000 System with Status Center
51-21-410X	Pump Plus 1000 System with Watertight Status Center
091-9-1000D-Charger	Pump Plus 1000 Charger Only
51-21-3200	Pump Plus 1000 Charger Only with Status Center
51-21-420X	Pump Plus 1000 Charger Only with Watertight Status Center

PUMP PLUS 1200 SYSTEM

- **Integrated Package: Air Compressor, Charger with Battery Saver & Remote Display**
- **System Components Maintain Air Brake Pressure, Batteries, and Power Auxiliary Loads**

Features

- Convenient system approach simplifies installation and wiring integration. Includes: Pump Plus 1200 and Auto Pump 12V
 - 100 PSI Max, 12V, air compressor "Auto Pump", see page 44 for specs and page 43 for optional accessories
 - Pump Plus 1200, 40A, single battery output
 - Automatic operation regulates output to a single battery bank
 - A patented built-in sense circuit checks battery voltage 120 times per second to compensate for voltage drop in charging wires providing quick recharge, with no overcharge
 - Gel cell/lead-acid switch selects optimum charge/float voltages based on battery type
 - Choice of Remote Display: Bar Graph, Status Center, or Status Center in watertight case
 - Air Compressor power mode selector switch
 - DC Powered full time from vehicle battery
 - AC Powered only when from battery when vehicle plugged into shore power. Automatically shuts off compressor when disconnected from shore power, taking 12A load off vehicle batteries

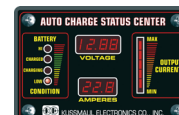


Part Number	Description
52-21-1100	Pump Plus 1200 System with Bar Graph Display
52-21-3100	Pump Plus 1200 System with Status Center
52-21-410X	Pump Plus 1200 System with Watertight Status Center
091-193-12	Pump Plus 1200 Charger Only
52-21-3200	Pump Plus 1200 Charger Only with Status Center
52-21-420X	Pump Plus 1200 Charger Only with Watertight Status Center

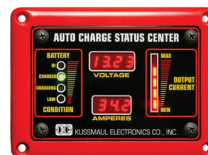
Remote Display Options



Bar Graph Display
091-199-001



Status Center Display
091-194A-IND



Status Center Display
in Watertight Case
091-194A-IND-WT-XX

Color Options

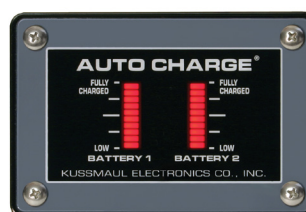
YW	RD
Yellow	Red
WH	GY
White	Gray
BL	BLK
Blue	Black

PUMP PLUS 2000 SYSTEM

- **Integrated Package: Air Compressor, Charger with Battery Saver & Remote Display**
- **System Components Maintain Air Brake Pressure, Batteries, and Power Auxiliary Loads**

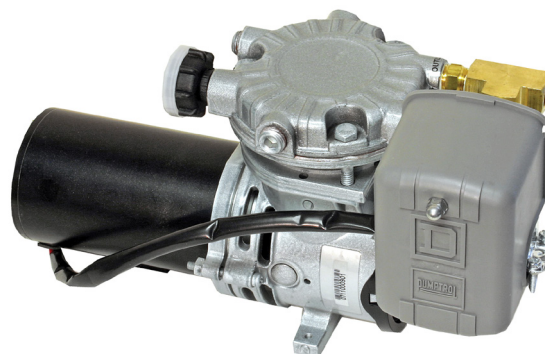
Features

- Convenient system approach simplifies installation and wiring integration. Includes: Pump Plus 2000 and Auto Pump 12V
 - 100 PSI Max, 12V, air compressor "Auto Pump" see page 44 for specs and page 43 for optional accessories
 - Model Pump Plus 2000 charger, 18A, single battery 15A with 3A battery saver
 - Automatic operation regulates output to a dual battery bank
 - A patented built-in sense circuit checks battery voltage 120 times per second to compensate for voltage drop in charging wires providing quick recharge, with no overcharge
 - Separate "Battery Saver" output eliminates drain on vehicle battery when in station:
 - Automatically disconnects auxiliary vehicle loads from battery when charger is energized
 - Ideal for charging hand lights and portable radios
 - 3A output with automatic overload current limit
 - Not recommended for powering highly sensitive electronic loads
- Remote Dual Bar Graph Display included
- Air Compressor power mode selector switch
 - DC Powered full time from vehicle battery
 - AC Powered only when from battery when vehicle plugged into shore power. Automatically shuts off compressor when disconnected from shore power, taking 12A load off vehicle batteries



Remote Bar Graph Display Included: 091-39-IND

- Provides state-of-charge status when in station
- Indicates charger "On" and operating



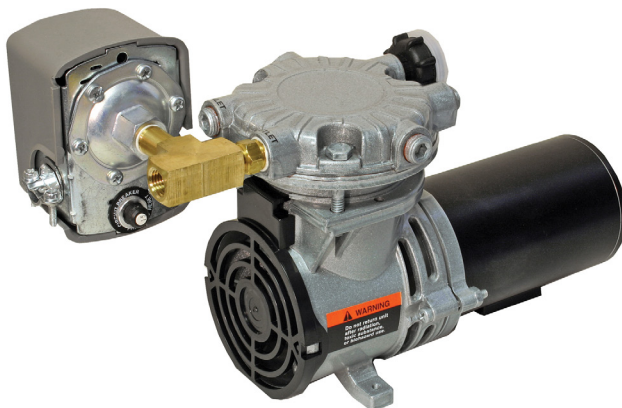
Part Number	Description
53-21-1100	Pump Plus 2000 System with Bar Graph Display
091-9-2000-Charger	Pump Plus 2000 Charger Only

PUMP PLUS HO SYSTEM

- **Integrated Package: Air Compressor, Charger with Battery Saver & Remote Display**
- **System Components Maintain Air Brake Pressure, Batteries, and Power Auxiliary Loads**

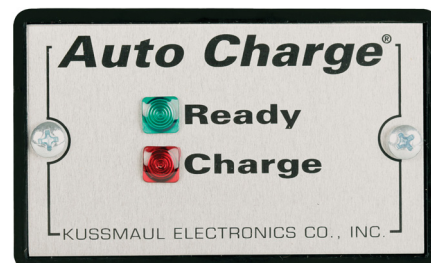
Features

- Convenient system approach simplifies installation and wiring integration. Includes: Pump Plus HO and Auto Pump 12V
 - 100 PSI Max, 12V, air compressor "Auto Pump", see page 44 for specs and page 43 for optional accessories
 - Model Pump Plus HO charger, 11A total, dual battery output
 - Automatic operation regulates output to a dual battery banks
 - A patented built-in sense circuit checks battery voltage 120 times per second to compensate for voltage drop in charging wires providing quick re-charge, with no overcharge
 - Optional Remote Display: LED Display
 - Air Compressor power mode selector switch
 - DC Powered full time from vehicle battery
 - AC Powered only when from battery when vehicle plugged into shore power. Automatically shuts off compressor when disconnected from shore power, taking 12A load off vehicle batteries



Part Number	Description
56-21-1100	Pump Plus HO System
091-9C-HO-Charger	Pump Plus HO Charger Only
IN-4	LED Display

Remote Display Option



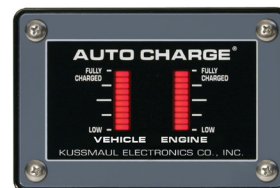
LED Display
IN-4

PUMP PLUS AUTO CHARGE D SYSTEM

- **Integrated Package: Air Compressor, Charger with Battery Saver & Remote Display**
- **System Components Maintain Air Brake Pressure, Batteries, and Power Auxiliary Loads**

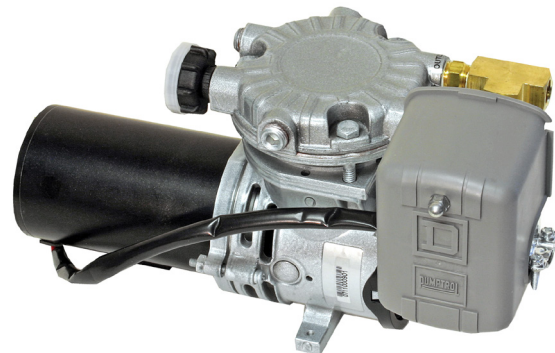
Features

- Convenient system approach simplifies installation and wiring integration. Includes: Pump Plus Auto Charge D and Auto Pump 12V
 - 100 PSI Max, 12V, air compressor "Auto Pump", see page 44 for specs and page 43 for optional accessories
- Model Pump Plus Auto Charge D charger, 33A, dual battery 28A with 5A battery saver
 - Automatic operation regulates output to a dual battery bar
 - Designed for DDEC Vehicles
 - A patented built-in sense circuit checks battery voltage 120 times per second to compensate for voltage drop in charging wires providing quick re-charge, with no overcharge
- Separate "Battery Saver" output eliminates drain on vehicle battery when in station:
 - Automatically disconnects auxiliary vehicle loads from battery when charger is energized
 - Ideal for charging hand lights and portable radios
 - 5A output with automatic overload current limit
 - Not recommended for powering highly sensitive electronic loads
- Remote Bar Graph Display included
- Air Compressor power mode selector switch
 - DC Powered full time from vehicle battery
 - AC Powered only when from battery when vehicle plugged into shore power. Automatically shuts off compressor when disconnected from shore power, taking 12A load off vehicle batteries



Remote Bar Graph Display Included: 091-66-IND

- Provides state-of-charge status when in station
- Indicates charger "On" and operating



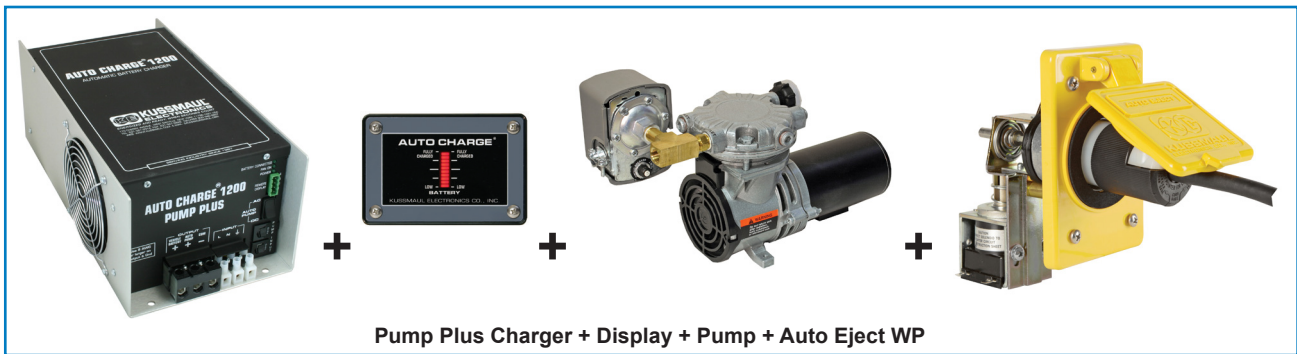
Part Number	Description
54-21-1100	Pump Plus D System with Bar Graph Display
091-9-DPP-Charger	Pump Plus D Charger Only

PUMP PLUS - AUTO EJECT KITS

- Includes Pump Plus Charger, Display, Auto Pump 12V and Auto Eject
- Pre-Packaged as a Kit for Installer Convenience
- Simplifies Ordering and Stockroom Handling

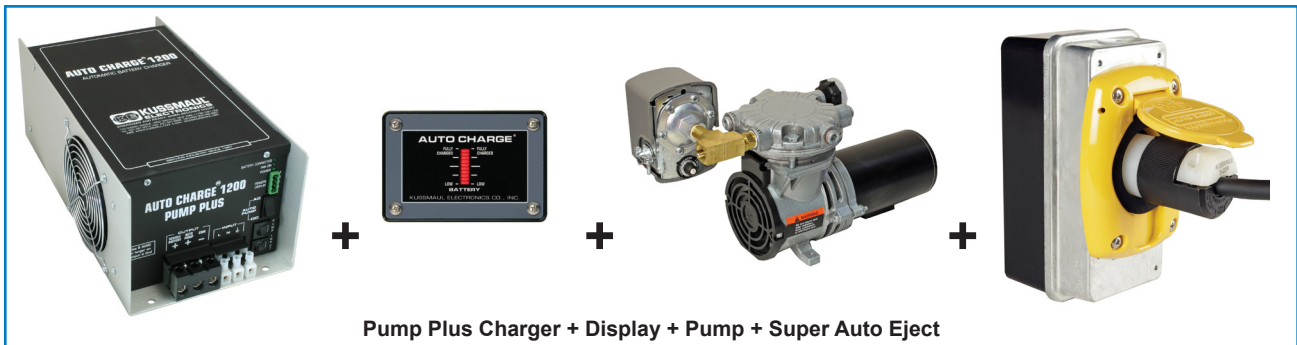
Kit Configuration Options

- Select Pump Plus Charger Model
- Select Display
- Select Display Bezel Color
- Select Auto Pump, with or without Auto Drain
- Select 15 or 20A Auto Eject
- Specify Back Wire (BW) (Super Auto Eject Only)
- Select Color Cover for Auto Eject
- Contact factory for your particular kit ordering information



Part Number	Description	Charger	Pump	Display	Auto Eject	Color Cover
53-22-1106	Pump Plus 2000 Kit	Pump Plus 2000	Auto Pump 12V	Dual Bar Graph	Auto Eject 20WP	Yellow
51-22-1204	Pump Plus 1000 Kit	Pump Plus 1000	Auto Pump 12V	Single Bar Graph	Auto Eject 15WP	Red
52-22-1105	Pump Plus 1200 Kit	Pump Plus 1200	Auto Pump 12V	Single Bar Graph	Auto Eject 20WP	White
52-22-4106	Pump Plus 1200 Kit	Pump Plus 1200	Auto Pump 12V	Watertight Status Center, Yellow	Auto Eject 20WP	Yellow

Popular Kits listed, contact factory for all other kit configuration options



Part Number	Description	Charger	Pump	Display	Auto Eject	Color Cover
53-23-1106	Pump Plus 2000 Super Kit	Pump Plus 2000	Auto Pump 12V	Dual Bar Graph	Super Auto Eject 20	Yellow
51-23-1204	Pump Plus 1000 Super Kit	Pump Plus 1000	Auto Pump 12V	Single Bar Graph	Super Auto Eject 15	Red
52-23-1105	Pump Plus 1200 Super Kit	Pump Plus 1200	Auto Pump 12V	Single Bar Graph	Super Auto Eject 20	White
52-23-4106	Pump Plus 1200 Super Kit	Pump Plus 1200	Auto Pump 12V	Watertight Status Center, Yellow	Super Auto Eject 20	Yellow

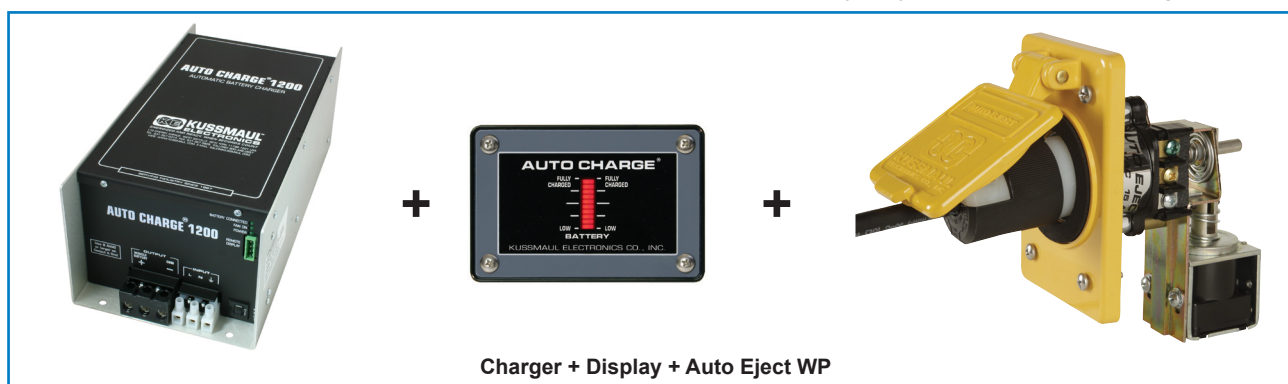
Popular Kits listed, contact factory for all other kit configuration options

CHARGER - AUTO EJECT KITS

- Includes Charger, Display and Auto Eject
- Pre-Packaged as a Kit for Installer Convenience
- Simplifies Ordering and Stockroom Handling

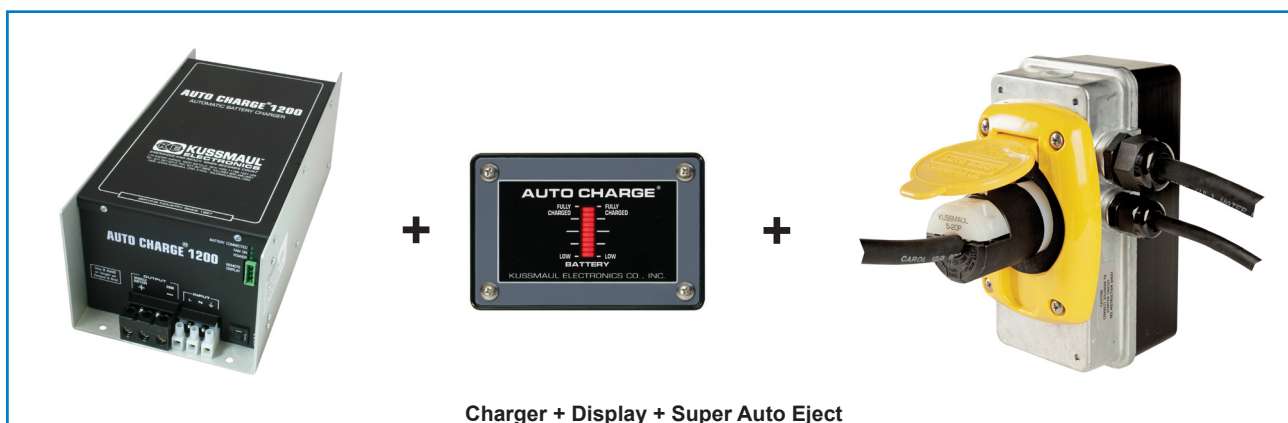
Kit Configuration Options

- Select Charger Model
- Select Display
- Select Display Bezel Color
- Select 15 or 20A Auto Eject
- Specify Back Wire (BW) (Super Auto Eject Only)
- Select Color Cover for Auto Eject
- Contact factory for your particular kit ordering information



Part Number	Description	Charger	Display	Auto Eject	Color Cover
53-02-1106	Auto Charge 2000 Kit	Auto Charge 2000	Dual Bar Graph	Auto Eject 20WP	Yellow
51-02-1204	Auto Charge 1000 Kit	Auto Charge 1000	Single Bar Graph	Auto Eject 15WP	Red
52-02-4106	Auto Charge 1200 Remote Kit	Auto Charge 1200 Remote	Watertight Status Center, Yellow	Auto Eject 20WP	Yellow

Popular Kits listed, contact factory for all other kit configuration options



Part Number	Description	Charger	Display	Auto Eject	Color Cover
53-03-1106	Auto Charge 2000 Super Kit	Auto Charge 2000	Dual Bar Graph	Super Auto Eject 20	Yellow
51-03-1204	Auto Charge 1000 Super Kit	Auto Charge 1000	Single Bar Graph	Super Auto Eject 15	Red
52-03-4106	Auto Charge 1200 Remote Super Kit	Auto Charge 1200 Remote	Watertight Status Center, Yellow	Super Auto Eject 20	Yellow

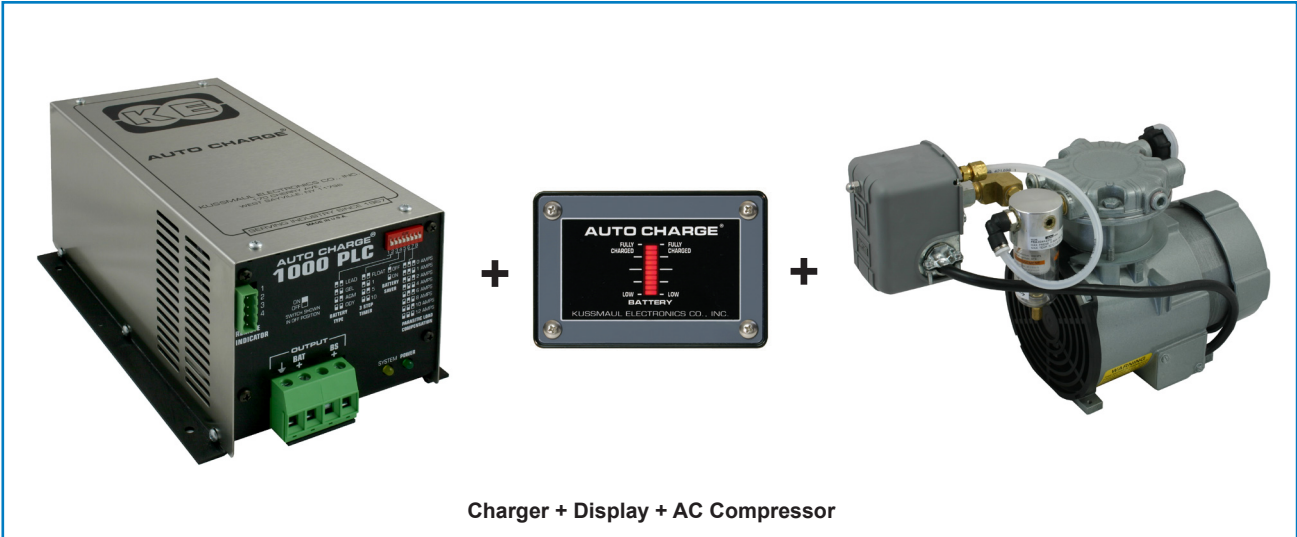
Popular Kits listed, contact factory for all other kit configuration options

CHARGER - AUTO PUMP AC

- Includes Charger, Display and AC Compressor
- Pre-Packaged as a Kit for Installer Convenience
- Simplifies Ordering and Stockroom Handling

Kit Configuration Options

- Select Charger Model
- Select Charger Display
- Select Display Bezel Color
- Contact factory for your particular kit ordering information



Popular Kits listed, contact factory for all other kit configuration options

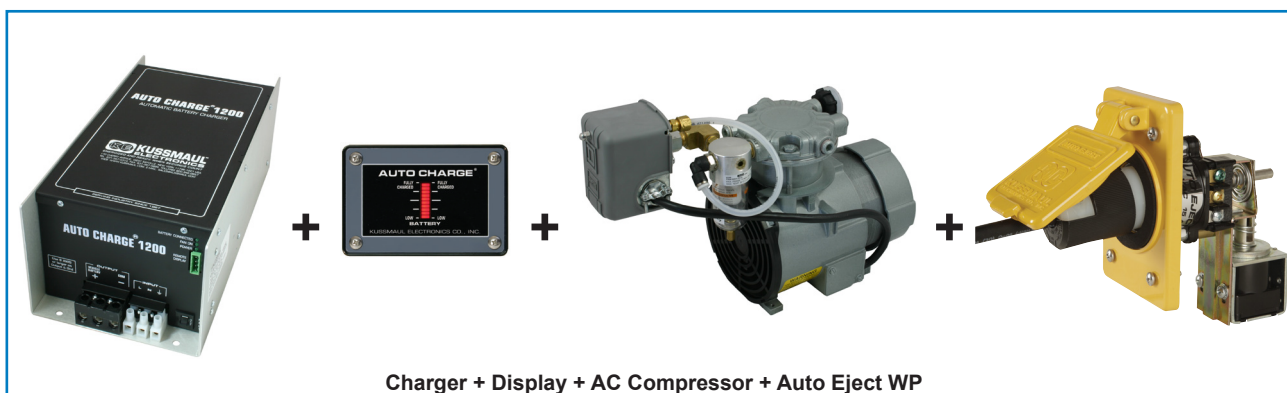
Part Number	Description	Charger	Display	Pump
53-05-1100	Auto Charge 2000 Pump Kit	Auto Charge 2000	Dual Bar Graph	Auto Pump AC
51-13-1100	Auto Charge 1000 HP Pump Kit	Auto Charge 1000	Single Bar Graph	Auto Pump HP
52-05-1100	Auto Charge 1200 Remote Pump Kit	Auto Charge 1200 Remote	Single Bar Graph	Auto Pump AC
52-09-4106	Auto Charge 1200 Remote Pump Kit	Auto Charge 1200 Remote	Watertight Status Center, Yellow	Auto Pump AC w/Auto Drain

CHARGER - AUTO PUMP AC - AUTO EJECT KITS

- Includes Charger, Display, AC Compressor and Auto Eject
- Pre-Packaged as a Kit for Installer Convenience
- Simplifies Ordering and Stockroom Handling

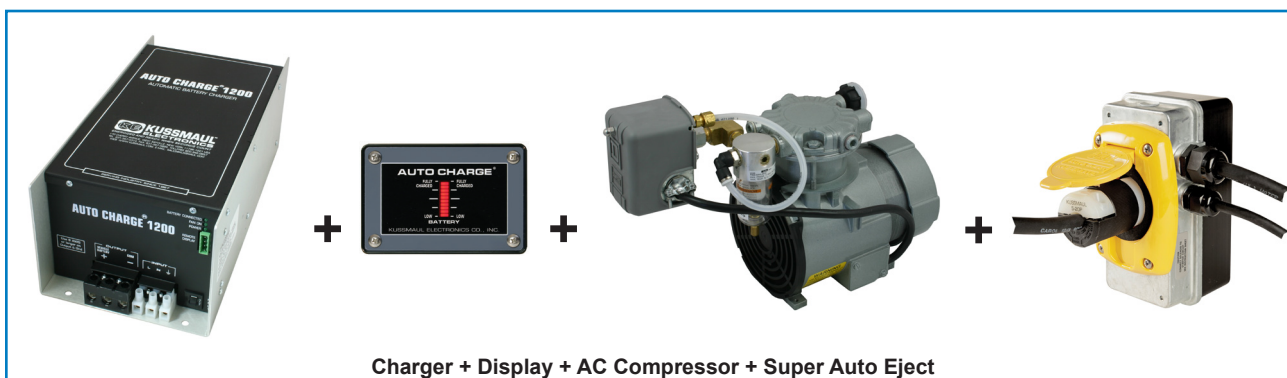
Kit Configuration Options

- Select Charger Model
- Select Display
- Select Display Bezel Color
- Select Auto Pump, with or without Auto Drain
- Select 15 or 20A Auto Eject
- Specify Back Wire (BW) (Super Auto Eject Only)
- Select Color Cover for Auto Eject
- Contact factory for your particular kit ordering information



Part Number	Description	Charger	Indicator	Pump	Auto Eject	Color Cover
53-06-1106	Auto Charge 2000 Pump WP Kit	Auto Charge 2000	Dual Bar Graph	Auto Pump AC	Auto Eject 20WP	Yellow
51-14-1204	Auto Charge 1000 HP Pump WP Kit	Auto Charge 1000	Single Bar Graph	Auto Pump HP	Auto Eject 15WP	Red
52-10-4106	Auto Charge 1200 Remote Pump WP Kit	Auto Charge 1200 Remote	Watertight Status Center, Yellow	Auto Pump AC w/Auto Drain	Auto Eject 20WP	Yellow

Popular Kits listed, contact factory for all other kit configuration options



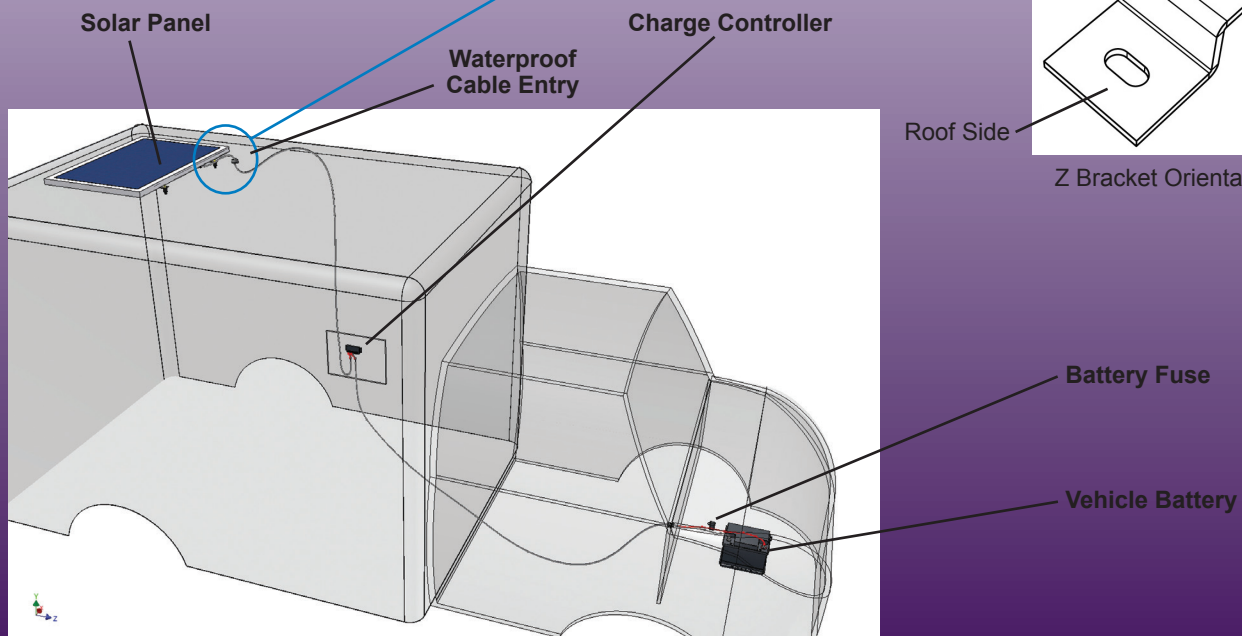
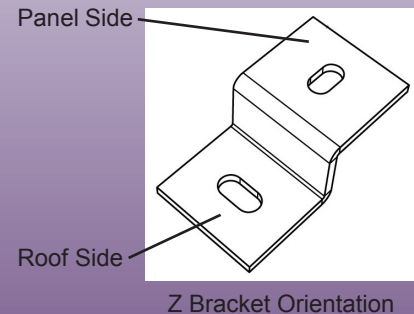
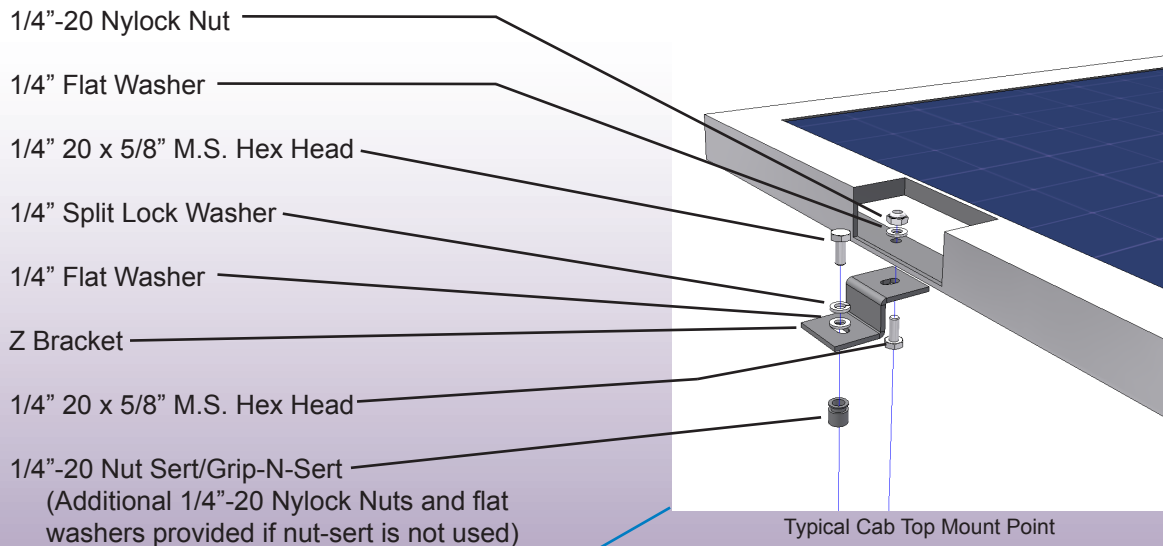
Part Number	Description	Charger	Display	Pump	Auto Eject	Color Cover
53-07-1106	Auto Charge 2000 Pump Super Kit	Auto Charge 2000	Dual Bar Graph	Auto Pump AC	Super Auto Eject 20	Yellow
51-15-1204	Auto Charge 1000 HP Pump Super Kit	Auto Charge 1000	Single Bar Graph	Auto Pump HP	Super Auto Eject 15	Red
52-11-4106	Auto Charge 1200 Remote Pump Super Kit	Auto Charge 1200 Remote	Watertight Status Center, Yellow	Auto Pump AC w/Auto Drain	Super Auto Eject 20	Yellow

Popular Kits listed, contact factory for all other kit configuration options

SOLAR CHARGING KITS



SOL Series
Standard Systems
Page 59



SOLAR PANELS

Features

- Industrial grade panel, components and heavy duty mounts designed for emergency vehicle use
- Numerous size panels match available roof space (1.2 to 7+A); panels can be wired for higher output
- Voltage controller adapts to properly charging different battery types
- Kits contain all parts needed for various types of vehicle installations
- 12 and 24V kits

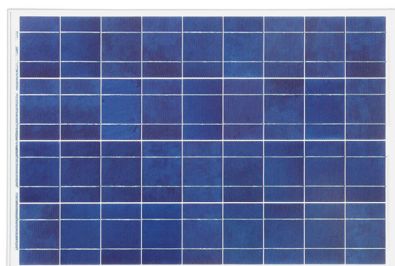
Benefits

- Keep up with radio load without running engine or plugging in
- Helps comply with anti idle laws
- Saves fuel cost and engine maintenance
- Eliminate the need to jump start reserve vehicles
- Ideal for vehicles with mobile computers and radio's



Complete Heavy Duty Kits Designed for Emergency Vehicle Installation

Solar Panel



Z-Brackets and Waterproof Cable Entry



Kit Includes:

Detailed instructions and parts provided, assures professional installation, eliminates installer guess work and parts sourcing

- Industrial grade solar panel with 10 year warranty
- Charge controller with temperature compensated, three-step output and battery type selection (Flooded/AGM)
- Heavy duty vibration dampened mounting system
- 20 foot duplex wire, terminals and cable ties
- Waterproof wire feed-through fitting included
- All mounting hardware included for various truck installations



Controller

Wiring & Connectors



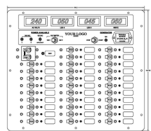
Part Number	Description	Electrical Data Specs		Dimensions			Wgt.
		DC Volts	DC Amps	L	W	H	
092-1220-0	SOL 20	12	1.2	21.7"	13.8"	0.98"	6.2
092-1245-0	SOL 45	12	2.5	26.2"	21.0"	1.38"	11.0
092-1265-0	SOL 65	12	3.7	38.9"	21.3"	1.38"	13.2
092-1280-0	SOL 80	12	4.9	39.9"	26.3"	1.38"	19.8
092-1210-0	SOL 100	12	5.9	39.9"	26.3"	1.38"	19.8
092-1220-1	SOL 120	12	7.0	57.7"	26.0"	1.97"	26.5
092-2440-0	SOL-24-40	24	1.2	26.2"	21.1"	1.38"	11.0
092-2460-0	SOL-24-60	24	1.7	38.9"	21.3"	1.38"	15.4
092-2485-0	SOL-24-85	24	2.5	39.9"	26.3"	1.38"	19.8
092-2412-0	SOL-24-120	24	3.6	57.7"	26.0"	1.97"	26.5
092-2421-0	SOL-24-210	24	7.1	64.6"	39.1"	1.97"	39.7

SECTION 7

120 / 240 VAC EQUIPMENT



Stock Electrical
Panels
Page 61



Custom Electrical
Panels
Page 62



Auto Interlock
II
Page 63



Auto Interlock
III
Page 63



Auto Interlock
IV
Page 63



Inverter - Chargers
Page 64



Inverters
Page 65

STOCK ELECTRICAL PANELS

- Specify Amperage Values and Labeling
- We'll Assemble to Your Specifications



ACCY-II
AC or DC, 3 Circuits
5.25" x 3.75"



ACCY-IX
AC or DC, 8 Circuits
5.25" x 7.50"



AC-II
AC Master
5.25" x 3.75"

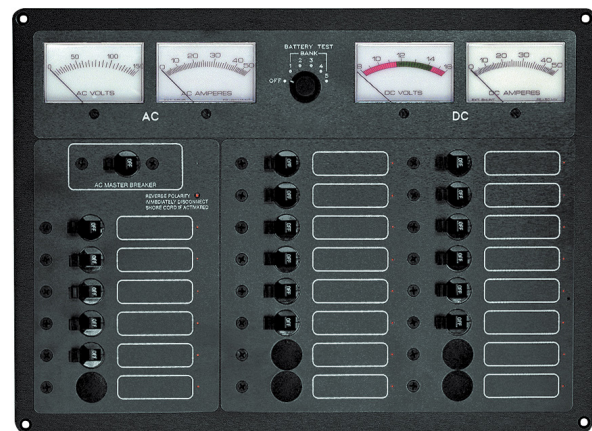
AC-IX
AC Master, 5 Circuits
5.25" x 7.50"



ES-6
DC Master,
10 Circuits
3.25" x 15"



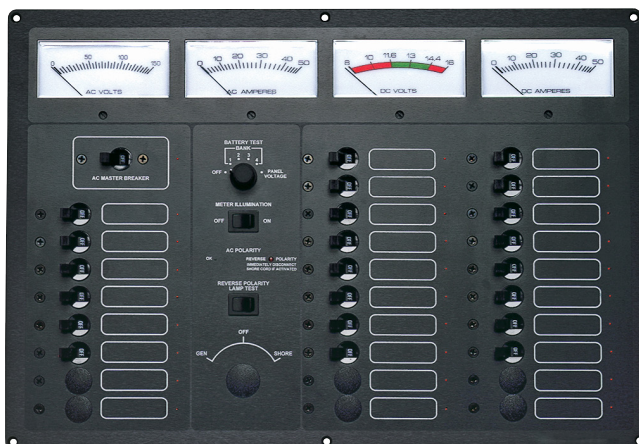
ES-7
AC or DC Master,
16 Circuits
3.25" x 15"



AC Master,
6 Circuits

ES-3
13.7" x 10"

16 DC
Circuits



AC Master,
8 Circuits

ES-4
17" x 12"

20 DC
Circuits



2 AC Load Groups,
10 Circuits,
Dual Shore Power
Selector Switch

ES-5
20" x 15"

DC Master,
24 Circuits

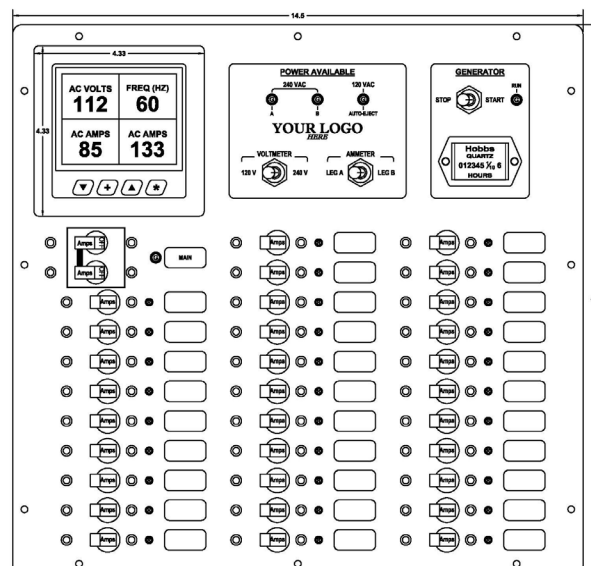
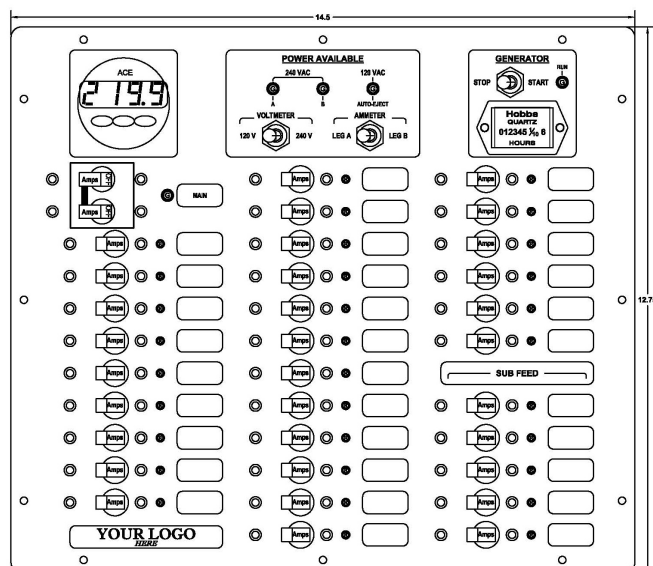
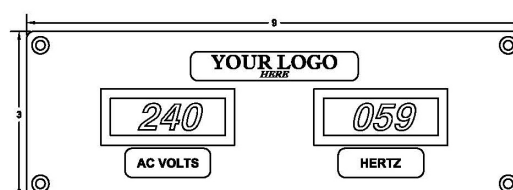
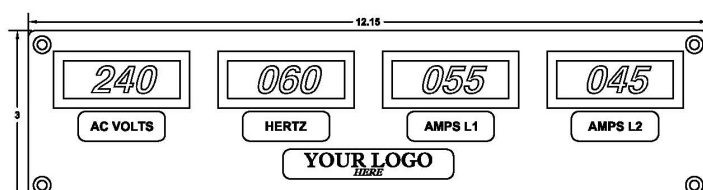
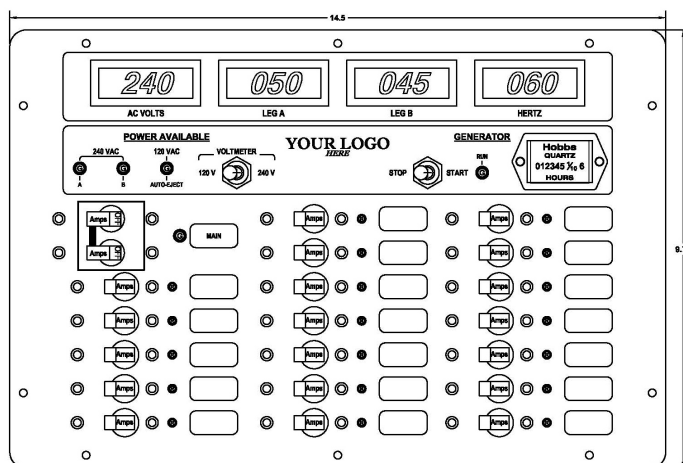
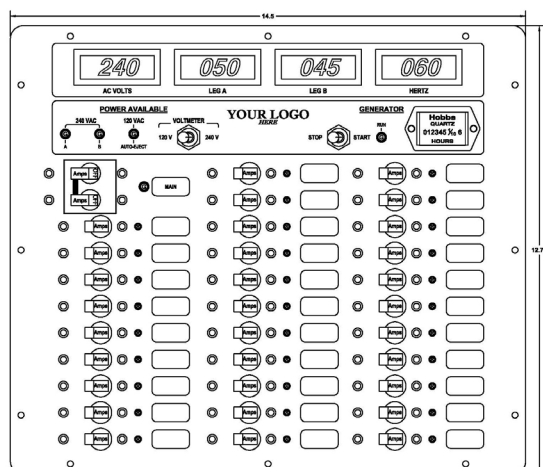
Brand Conversion From NEWMAR

120 / 240 VAC EQUIPMENT

CUSTOM ELECTRICAL PANELS

- Electrical Panels to Match Your Precise Requirements
- Send Us Your Sketch, and We'll Do the Rest
- CAD Drawings for Approval
- Quick Delivery of Finished Product

- We make it easy for you, assisting layout and component selection
- UL listed components
- Any size/shape panel face
- Totally custom graphics, lettering, logos or language
- Circuit breakers/switches/fuses
- Indicator lights, audio alarms
- Digital or analog meters/instrumentation
- AC-DC
- Back lighting
- Fully assembled, partially loaded or panel blank
- Pre-wired, ready for installation



POWER TRANSFER SWITCH

- Transfer Load from Shore Power to Generator
- Automatic Operation

Auto Interlock II

Features

- 20A, double pole relay
- Rapid relay transfer time
- Hard wire installation
- Indicator lights activate identifying transfer switch position source: shore or generator
- Models available for 120 and 240V operation
- Powder coated, steel case



Part Number	Description	Electrical Data	Dimensions			Wgt.
		AC Volts	L	W	H	
091-134	Auto Interlock II	120V	4.5"	7.0"	3.5"	2
091-134-230	Auto Interlock II	240V	4.5"	7.0"	3.5"	2

Auto Interlock III

Features

- 15A outlet
- Rapid relay transfer time
- Easy plug-in installation, no hard wiring required. Generators and shore input cable with molded plugs provided
- Indicator lights activate identifying transfer switch position source: shore or generator
- 120V operation
- PVC case



Part Number	Description	Electrical Data	Dimensions			Wgt.
		AC Volts	L	W	H	
091-134A	Auto Interlock III	120V	4.5"	7.0"	7.0"	2

Auto Interlock IV

Features

- 50A, four pole, double throw relay
- 120V, 3 wire or 240V, 4 wire compatible
- Can be used to transfer two separate shore/generator circuits
- Hard wire installation
- Transfer time delay adjustable from 2 seconds to 10 minutes, allows generator to warm up and stabilize before connecting to load, Factory set @ 24 seconds, specify if modification required when ordering



Part Number	Description	Electrical Data	Dimensions			Wgt.
		AC Volts	L	W	H	
091-197	Auto Interlock IV	120/240V	4.25"	8.50"	8.50"	2

120 / 240 VAC EQUIPMENT

INVERTER - CHARGERS

- High Power DC-AC Inverters with Built-in Battery Charger
- Pure Sine Wave Output



12-1200IC EV



Brand Conversion From NEWMAR

Features

- Generates Perfect Sine Wave AC* for powering any appliance, from wattage-hungry power tools to highly input-sensitive computers, electronic controllers/processors
- Built-in high output 3 stage charger for rapid battery bank replenishment, programmable for, gel-cell, flooded lead- acid or AGM battery type
- Duplex AC outlet on front panel, GFI protected
- Built-in automatic load transfer relay (45mS transfer time)
- Front panel status indicators — optional remote display available
- Numerous safety and circuit protections: short circuit, over load, over-temperature, ground fault protection, output circuit breaker
- Automatic low voltage shutdown circuit prevents damage to batteries due to over-discharge when using inverter function
- Heavy duty powder coated aluminum construction and conformal coated internal circuitry – built to last in the rugged field environment
- UL listed

Remote Display Options

KE KUSSMAUL ELECTRONICS
INVERTER STATUS

INVERTER FAULT
BLINK: STANDBY
STEADY: ON

**Inverter Status Panel
with 20' of Cable
Model #: 020-4289-0
Used with: 430-1200-0**

KE KUSSMAUL ELECTRONICS
CHARGER STATUS

CHARGER FAULT
BLINK: BULK, ACCEPT MODE
STEADY: FLOAT MODE

**Charger Status Panel
with 20' of Cable
Model #: 020-4290-0
Used with: 430-1200-0**

Inverter / Charger Status & Control

AC Source: External, Inverter, Low input voltage, Overload, High temperature, Shutdown Mode

Charger Status: Float mode, 3-Stage mode, 100% charge, 80% charge, Timed-Out, Charge Incomplete, Battery Status

Inverter ON/OFF switch

**Inverter / Charger
Status Control Panel**

**Model #: 020-4286-0 (25' Cable)
or
Model #: 020-4286-5 (50' Cable)
Used with:
430-1800-0
430-3000-0
430-2200-0
430-4800-0**

Part Number	Description	Electrical Data			Dimensions			Wgt.
		Input	AC Out	Battery Charger Rating	L	W	H	
430-1200-0	12-1200IC-EV	12V	1200W @ 115V	55A	12.00"	16.00"	7.50"	54
430-1800-0	12-1800IC	12V	1800W @ 115V	85A	15.50"	16.00"	7.50"	57
430-3000-0	12-3000IC	12V	3000W @ 115V	105A	16.00"	17.00"	10.00"	95
430-2200-0	24-2200IC	24V	2200 @ 115V	40A	15.50"	16.00"	7.50"	57
430-4800-0	24-4800IC	24V	4800 @ 115V	100A	16.00"	17.00"	10.0"	95
020-4286-0	ICR-2-25	N/A	N/A	N/A	.50"	4.50"	4.50"	.2
020-4286-5	ICR-2-50	N/A	N/A	N/A	.50"	4.50"	4.50"	.2
020-4289-0	Inverter Panel	N/A	N/A	N/A	.1875"	2.00"	3.00"	.2
020-4290-0	Charger Panel	N/A	N/A	N/A	.1875"	2.00"	3.00"	.2

- **Pure Sine Wave Output**
- **High Surge Power for Motor Start**

Features

- Pure sine wave output
- 12V input
- Power saving mode conserves battery when not in use
- Built in advance microprocessor to make friendly interface with user
- RS-232 communication
- AC duplex outlet on front panel (SP700, SP1000, SP1500 & SP2000 Models only)
- Temperature & Load controlled cooling fan
- Output voltage (100, 110, 115 & 120) DIP switch selectable
- Output frequency (50/60Hz) DIP switch selectable
- Tri-color indicators display status
- Protection:
 - Over input voltage
 - Low input voltage
 - Overload
 - Short circuit
 - Over temperature
 - Reverse polarity
- Rugged compact case, ideal for emergency vehicle applications
- E-13 / UL / CE / FCC approved



Models: SP700, SP1000, SP1500 & SP2000 shown above



Models: SP3000 & SP4000 shown above



Optional remote control display

Part Number	Description	Electrical Data			Dimensions			Wgt.
		Input	AC Out Continuous	AC Out Surge	L	W	H	
450-0700-0	SP 700	12V	700W @ 115V	1230W	11.52"	7.87"	3.27"	5.73
450-1000-0	SP 1000	12V	1000W @ 115V	1750W	13.18"	7.87"	3.46"	7.14
450-1500-0	SP 1500	12V	1500W @ 115V	2650W	15.06"	9.76"	3.46"	9.17
450-2000-0	SP 2000	12V	2000W @ 115V	3500W	15.93"	9.76"	3.46"	11.55
450-3000-0	SP 3000	12V	3000W @ 115V	6000W				
450-4000-0	SP 4000	12V	4000W @ 115V	8000W				
450-0050-0	CR-8, Optional Remote Control for all models shown above				2.76"	2.11"		1
* All models listed above available in 24Vdc, 48Vdc, please contact sales for more information								
** All Models listed above available in 200, 220, 230 & 240Vac, please contact sales for more information								

SECTION 8

DC POWER MANAGEMENT

SECTION 8 - DC POWER MANAGEMENT



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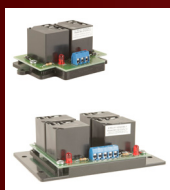
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Mobile Data Power System

- Protects mobile computers against system crash, lengthy reboot sequences, and loss of data
- Internal battery provides supplemental 12 volts to mobile data devices when low vehicle battery is sensed: 5A for 60 minutes, 10A for 20 min., and 25A for 8 min.
- Built in Multi-Stage filter provides clean power required by mobile electronics
- Provides low output warning signals to mobile computers (such as Motorola® MW 800 series work stations)
- Internal 3 stage, temperature compensated charger maintains internal 9 A/H back-up battery in fully charge stand-by state
- Heavy duty aluminum case with access door for easy battery removal

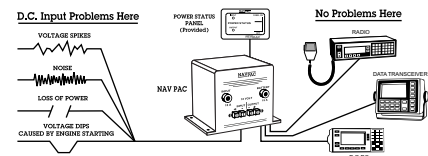


Brand Conversion From NEWMAR

Part Number	Description	Dimensions			Wgt.
		L	W	H	
425-5230-0	MDP-25	8.00"	6.00"	5.75"	10

NAV-PAC™

- Provides long duration voltage stabilization, electronics on-line with internal battery which is maintained by vehicle battery
- Upon sensing low or loss of input, internal battery continues to provide supplemental power: 8A for 15 minutes, 12A for 8 min., and 18A for 2 min
- Timer disconnects output 15 minutes after loss of input
- Absorbs line "spikes" and filters out electrical interference
- Configuration with front panel power switch optional



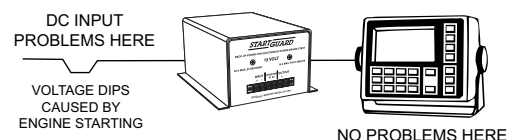
Part Number	Description	Dimensions			Wgt.
		L	W	H	
425-2988-0	NP-12, 20A	7.40"	6.20"	5.25"	6

StartGuard™

- Provides momentary voltage stabilization to electronics during engine start
- prevents programmed memory dump and re-boot of microprocessor based voice and data transmitters
- Internal battery is switched on-line to electronics when the starter solenoid is engaged
- When engine is running, StartGuard goes off-line and the internal battery is re-charged by the alternator
- Input Voltage: 13.8 - 14.8 VDC nominal, 15.5 VDC max.
- Output: 20 amps max. for 1 minute, 18A 2 minutes
- Battery: 12 VDC, sealed rechargeable 5 A/H, 5 - 7 year life (typical)



Brand conversion from NEWMAR



Part Number	Description	Dimensions			Wgt.
		L	W	H	
426-3222-0	NS-12-20	3.50"	4.90"	8.25"	6

• Voltage Stabilizing Converters • Constant Output Voltage from Variable Input

- Operate electronics at optimal input voltage, even from nearly drained batteries
- Boost voltage to loads to compensate for drop in long wire runs from batteries
- Eliminate voltage drops during momentary high current drain from batteries, as during engine start
- Eliminate voltage fluctuation produced by charging sources
- Eliminate voltage overshoot resulting from disconnect of high current loads



Brand Conversion From NEWMAR

Part Number	Description	Electrical Data			Dimensions			Wgt.
		Input Volts	Output Volts	Output Amps	L	W	H	
460-0123-0	12-12-3I	10-16	13.6	3	1.75"	3.5"	3.5"	1
460-1212-0	12-12-6I	10-16	13.6	6	1.75"	3.5"	3.5"	1
460-0610-0	12-12-12I	10-16*	13.6	12	14.0"	5.9"	4.25"	6
460-0617-0	12-12-35	10-16*	13.6	35	16.5"	6.8"	6.0"	12

* 11.5V minimum start-up voltage, then operates @ 10-16V from 1A minimum to full load, 24V models available, contact factory

Noise Filters

Filters and regulates DC output to a constant 12V to power sensitive electronic equipment, assuring noise free operation. Regulated output is ideal for powering voltage sensitive hand lights chargers that have difficulty operating from battery saver outputs.



Part Number	Description	Electrical Data			Dimensions			Wgt.
		Input Volts	Output Volts	Output Amps	H	W	D	
091-137	Battery Saver Filter	12-15	13.8	3	5.10"	2.95"	1.55"	1
380-2010-1	PC-10, Noise Filter	12/24	12/24	10	1.38"	3.49"	2.99"	1
380-1258-1	PC-25, Noise Filter	12/24	12/24	25	2.08"	4.20"	3.23"	2

DC Converters

Convert 20-50V input to 12V output for powering communication equipment, on negative ground systems. Ideal for powering voice and data electronics. Rugged anodized aluminum case designed to survive in high vibration environments onboard emergency and off-road vehicles. 12 to 24V step-up converters also available, contact factory.



Brand Conversion From NEWMAR

Part Number	Description	Electrical Data			Dimensions			Wgt.
		Input Volts	Output Volts	Output Amps	L	W	H	
420-2403-0	24-12-3	17-32	13.6	3	1.75"	3.50"	3.50"	1
420-3826-0	32-12-6	20-50	13.6	6	10.40"	4.20"	2.80"	3
420-3550-0	32-12-10	20-50	13.6	10	11.00"	5.90"	4.50"	4
420-3535-0	32-12-15	20-50	13.6	15	11.00"	5.90"	4.50"	5
420-3544-0	32-12-25	20-50	13.6	25	14.00"	4.70"	6.00"	8
420-3545-0	32-12-35	20-50	13.6	35	16.00"	4.70"	6.00"	12
420-3536-0	32-12-50	20-50	13.6	50	18.10"	6.80"	6.20"	16

AUTO ISOLATOR I & AUTO ISOLATOR 3

- High Efficiency, No Diode Drop
- Eliminates Diode Isolator in 2 or 3 Battery System

Auto Isolator I Features

- System consists of a controller that detects when a vehicle's alternator is charging the main battery and then closes a solenoid to tie-in charge to an auxiliary battery
- When the engine is stopped or charge voltage is no longer present, the solenoid opens to isolate the batteries
- Upon "cranking" the engine with a charged auxiliary battery, the solenoid is energized to parallel the batteries and provide a starting boost
- If the auxiliary battery is low, the controller senses that condition and the batteries are not paralleled
- Uses a solenoid rather than an isolation diode which typically causes a 0.7 volt drop, thus auxiliary battery receives full charge voltage
- The starting boost provided by the paralleled batteries is especially useful in cold weather or when the battery is low



Controller

Auto Isolator 3 Features

- System consists of a controller and two separate solenoids, for switching the batteries
- Allows a three battery system to be isolated from each other
- The system receives its power from the Battery 1 input or it can be switched on/off
- When any of the 3 batteries go above 13.2 volts all 3 batteries are paralleled by the solenoids being energized thus charging all 3 batteries and will disconnect the batteries when the voltage drops below 12.6 volts



Solenoid

Specifications

Auto Isolator I Controller: 091-139-CONT-12

Actuation Voltage: $\leq 13.3V$ (field adjustable)

Battery Load: 0.000125A

Output Current: 3A

Auto Isolator 3 Controller: 091-208-CONT-12

Volts to parallel, normal operation: 13.2 volts

Hysteresis: 0.60 volts (13.2 volts on - 12.6 volts off)

Battery Load: 0.020A

Output Current: 3A

Auto Isolator I & 3 Solenoid: 091-139-SOL-12HO

Volts: 12V

Coil Current: .65A

Contact Rating: 200A cont./600A surge

Note that Auto Isolator 3 uses two of this solenoid

Part Number	Description	Dimensions			Wgt.
		H	W	D	
091-139-CONT-12	Auto Isolator I Controller	5.10"	2.95"	1.55"	0.5
091-208-CONT-12	Auto Isolator 3 Controller	5.10"	2.95"	1.55"	0.5
091-139-SOL-12HO	Auto Isolator I & 3 Solenoid	3.60"	3.30"	2.80"	2.0

Load Manager P

- Preserves Charge in Vehicle Battery via two functions:
 - Timer disconnects electronic loads after engine shutdown
 - Battery condition sensor disconnects loads when critical low voltage is sensed
- Timer and low voltage activation set points are user adjustable



Features

- Prevents total discharge of vehicle batteries caused by electronic loads left on after vehicle is parked
- After engine shut down, timer disconnects radios and computers after 1 - 2 hours (user selectable)
- Low voltage sense circuit activates disconnect anytime critical low voltage is detected
- Sense circuit prevents nuisance disconnect caused by low voltage during engine start sequence
- 30 amp high capacity disconnect relay manages multiple electronic loads

Part Number	Description	Electrical Data Specs		Load Shed Setpoint Range	Dimensions			Wgt
		DC Volts	DC Amps		L	W	H	
091-141	Load Manager P	12	30	11.00V to 12.85V*	1.55"	5.10"	2.95"	.5
091-141-24	Load Manager P, 24 Volt	24	30	21.25V to 24.75V*	1.55"	5.10"	2.95"	.5

*Factory Set to 11.00V / 22.00V

Power Timer

- Prevents dead batteries due to accessories being left on and forgotten
- Programmable disconnect time limit: 15 minutes to 8 hours



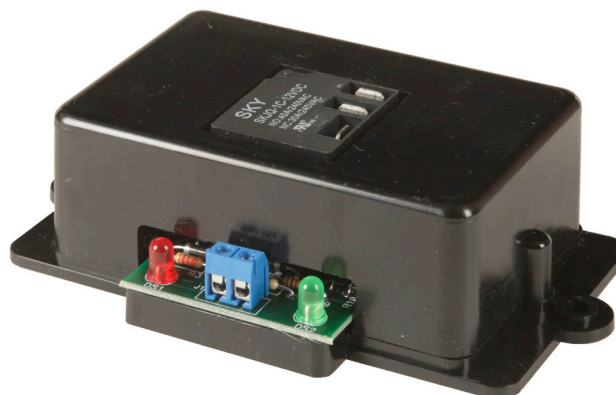
Features

- Time out programming via dip switches on top of unit
- LED's indicate output status
- 30 amp rating controls multiple auxiliary loads on vehicle
- High and low voltage disconnect also built-in
- Rugged construction; components epoxy potted for survival in vibration
- Optional ignition sense wiring restores power immediately to radios when ignition is activated, rather than having to start engine

Part Number	Description	Electrical Data Specs		Time Out Range	Dimensions			Wgt
		DC Volts	DC Amps		L	W	H	
390-0030-5	Power Timer	12	30	15 Min. to 8 Hrs.	2.00"	4.30"	2.13"	1.0

Load Manager 1 H

- Monitors 12V system and when detecting low voltage setpoint, disconnects load
- Automatically reconnects load when battery recovers 1.4V above disconnect setpoint
- Preserves battery, prevents total discharge



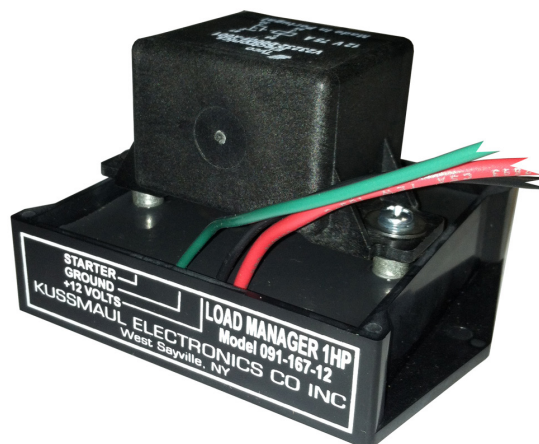
Features

- Preserves batteries from total discharge by disconnecting loads when critical low voltage is sensed
- Reconnect sequence requires 1.4 volts recovery above disconnect set point ensuring battery condition improvement before loads are re-applied
- Field adjustable set and reconnect points for specific vehicle configuration
- Green / Red LED's indicates normal or low voltage condition.
- Compact case, easy to install

Part Number	Electrical Data				Dimensions			Wgt.
	Input Voltage	Amperage	Set Point	Adj. Range	L	W	H	
091-96-12	12	30	12.0 \pm 0.05V	10.5 to 13V	2.63"	4.00"	1.50"	.25
091-96-24	24	30	24.0 \pm 0.05V	21 to 26V	2.63"	4.00"	1.50"	.25

Load Manager 1 HP

- Low voltage disconnect preserves batteries from total discharge by disconnecting loads when critical low voltage is sensed
- Engine start sensor prevents nuisance disconnect due to low voltage occurring during engine start



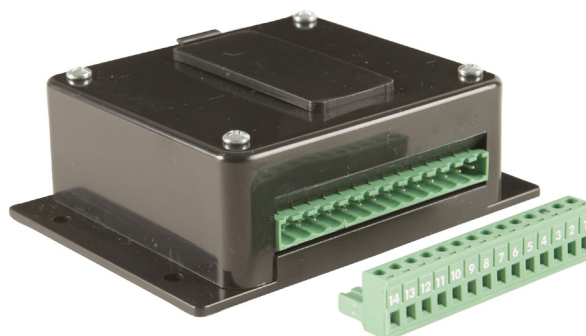
Features

- Monitors battery and de-energizes up to 75 amp load when the voltage drops to 11.5 volts
- Automatically reconnects when battery recovers above 12.8V, ensuring battery condition improvement before loads are re-applied
- Encapsulated components for survival in high vibration and wet area applications

Part Number	Electrical Data				Dimensions			Wgt.
	Input Voltage	Amperage	Set Point	Adj. Range	L	W	H	
091-167-12	12	75	11.5 \pm 0.05V	10.5 to 13V	2.35"	3.10"	4.00"	.5

Load Manager

- Sends output signals in 1/2 second sequence to energize and disconnect up to seven control relays
- Applies load to system in a step fashion, allowing for voltage stabilization as equipment is added
- Automatically sheds loads sequentially when low voltage is sensed, maintaining proper voltage to high priority equipment



Features

- Assures loads are applied and removed gradually, smoothing voltage variation and preventing damage to sensitive loads
- When activated by a master switch, load control signals are generated in sequential order in 1/2 second delay as programmed by installer
- When master switch deactivated, loads are sequentially de-energized
- Monitors vehicle for low voltage condition and automatically sends signal to sequentially disconnect up to 5 low priority loads, thus maintaining voltage to critical equipment
- Manual override input provided
- Included monitor panel alerts operators when load shedding has occurred due to low voltage
- 12V, 80 ohm signal output activates standard vehicle lamp and auxiliary relays, supplied by installer

Part Number	Description	Electrical Data Specs		Load Shed Factory Set Point	Dimensions			Wgt
		DC Volts	DC Amps		L	W	H	
091-32	Load Manager, with Indicator	12	30	11.5V	1.63"	4.75"	3.50"	.5

Load Manager 2

- Prioritized sequential load shedding of 2 circuits as battery voltage decays
- Dedicates battery power to critical equipment under low voltage conditions



Features

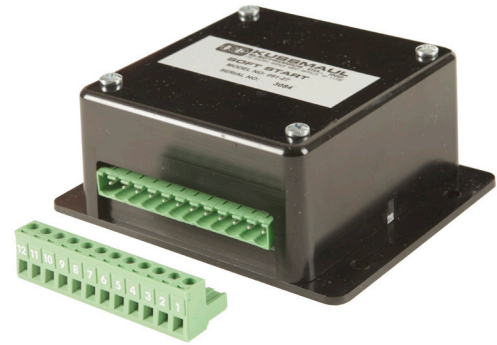
- Ensures most essential equipment has power priority over other loads when batteries are low
- Sequential circuit sheds low priority loads first ensuring longer run time for critical equipment. Automatic reset when voltage recovers, reconnecting high priority load first
- Prevents total discharge of battery by disconnecting all loads at critical low voltage set point
- Adjustable disconnect activation voltage set point
- 30A rating per circuit, 60A total (12 & 24V)

Part Number	Description	Electrical Data Specs		Load Shed Factory Set Point	Dimensions			Wgt
		DC Volts	DC Amps		L	W	H	
091-79	Load Manager 2	12	30	11.5V	1.63"	4.25"	3.50"	.5
091-79-24	Load Manager 2, 24V	24	30	24V	1.63"	4.25"	3.50"	.5

Soft Start

Features

- Automatically sequences lights on and off
- Eliminates power surges and sags in electrical system
- Controls lamp relays
- Easy installation



The "Soft Start" is a precision, solid-state controller, which sequentially switches "ON" seven loads at 1/2 second intervals. Individual switches (user provided), can select a combination of outputs. These switches may be used to turn the outputs "ON" or "OFF" at any time. Using a "Master Control" switch starts the sequential switching when it is turned "ON". Similarly turning the "Master Control" switch "OFF" sequentially de-energizes the loads at 1/2 second intervals. A plug-in connector simplifies installation.

Sequential switching of lamp loads is particularly important for vehicles with many lights. A Master switch that simultaneously controls a large number of lights can cause voltage dip and overshoot which may damage sensitive electronic equipment. The LOAD MANAGER assures loads are applied and removed gradually, thus smoothing voltage variation and preventing damage to sensitive loads.

Part Number	Description	Dimensions			Wgt.
		L	W	H	
091-27	Soft Start	4.25"	3.50"	1.50"	2

Timer-X

Features

- May be used as:
 - Delay-on-Pull-In relay, DOPI
 - Delay-on-Drop-Out relay, DODO
 - Duty Cycle-Timer relay
- Timer utilizes switches for precise settings from 1 second to 99 hours
- 30 Amp relay switches AC or DC loads
- Flexible triggering either +12 volt or ground
- Operates on DC or AC Power

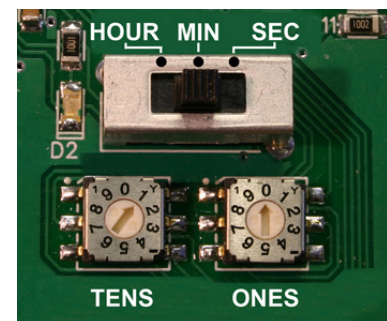


The precise TIMER-X universal timer may be operated in any of three modes, DOPI, DODO or CYCLE. The quartz crystal based timer intervals are easily and accurately set in the field using switches and a small screwdriver. The timer supports intervals in the broad range of one second to 99 hours. In the Cycle mode the ON and OFF times are independently controlled and may be set over the full range of time from 1 second to 99 hours. The heavy-duty, 30 ampere, output relay provides both normally OPEN and normally CLOSED contacts and a red LED indicates when the relay is energized.

Flexible input triggering allows for either +12 VDC or a contact closure to ground to initiate the timing cycle.

Part Number	Description	Dimensions			Wt.
		L	W	H	
091-214-12	Universal Timer, 12 Volt	4.75"	3.50"	1.60"	.5
091-214-24	Universal Timer, 24 Volt	4.75"	3.50"	1.60"	.5
091-214-120/240	120/240 Vac Adapter	N/A	N/A	N/A	.5

Timer Settings



Auto Current

Features

- Senses current flowing in and provides remote indication that a load is operating
- Simplifies vehicle wiring
- Single indicator activates from many inputs



The Auto Current detects current flow and closes a relay providing a remote indication. Designed for applications where a remote indicator/warning light must be illuminated when one or more lights or other loads are energized. By detecting load current, any lamp or other load will cause the indicator to light. The indicator circuit may be completely isolated from the circuit being sensed, or may be operated from the same battery.

Note: Standard unit supplies +12V to indicator. Available as -G for operating indicator by grounding.

Part Number	Description	Electrical Data			Switch Rating 12V	Dimensions			Wgt.
		Resistance Ohms	Min. Operating Amps	Max. Operating Amps		H	W	D	
091-22-2	Auto Current -2	0.01	1.0	30	5A	2.63"	4.00"	1.50"	.25
091-22-3	Auto Current -3	0.01	0.5	30	5A	2.63"	4.00"	1.50"	.25
091-22-5	Auto Current -5	0.02	0.25	10	5A	2.63"	4.00"	1.50"	.25
091-22-6	Auto Current -6	0.02	0.10	4	5A	2.63"	4.00"	1.50"	.25
091-22-100	Auto Current -100	0.0003	4	100	5A	2.63"	4.00"	1.50"	.25

Auto Current A

Features

- Senses current
- Auxiliary input, ground to operate
- Simplifies vehicle wiring
- Single indicator activates from many inputs



The Auto Current A is an Auto Current with auxiliary input, which when grounded causes the output relay to operate. When the output relay is operated, it cycles ON and OFF to create a signal. The Auto Current portion of this device senses current, permitting use as an open door detector. The auxiliary input may be connected to any number of switches in parallel. Closing any switch operates the Auto Current A in addition to the current sensing. This feature makes it ideal as a detector for a DO NOT MOVE VEHICLE indicator. As with the standard Auto Current, the sense terminals are wired in series with the power supplied to the compartment lights.

Note: Standard unit supplies +12V to indicator. Available as -G for operating indicator by grounding.

Part Number	Description	Electrical Data			Switch Rating 12V	Dimensions			Wgt.
		Resistance Ohms	Min. Operating Amps	Max. Operating Amps		H	W	D	
091-22-A	Auto Current -A	0.01	1.0	30	5A	2.63"	4.00"	1.50"	.25
091-22-A-6	Auto Current -A-6	0.2	0.10	4	5A	2.63"	4.00"	1.50"	.25

Auto Current F

Features

- Senses current flow
- Provides remote indication
- Simplifies vehicle wiring
- Single indicator operated from many loads
- Produces flashing output signal to indicator light



The Auto Current F detects current and closes a switch when the sensed current flows to provide a remote indication. Designed for applications where a remote indicator must be illuminated when one or more lights or other loads are energized. By detecting load current, any lamp or other load will cause the indicator to light. The indicator circuit may be completely isolated from the circuit being sensed, or may be operated from the same battery. A timer flashes the indicator lamp at 1 second intervals providing a highly visible display.

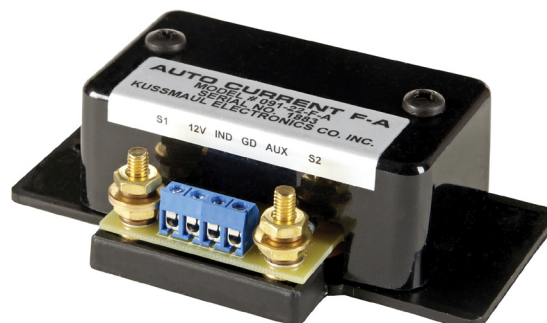
Note: Standard unit supplies +12V to indicator. Available as -G for operating indicator by grounding.

Part Number	Description	Electrical Data			Switch Rating 12V	Dimensions			Wgt.
		Resistance Ohms	Min. Operating Amps	Max. Operating Amps		L	W	H	
091-22F-2	Auto Current F-2	0.01	1.0	30	5A	2.63"	4.50"	1.50"	.25
091-22F-3	Auto Current F-3	0.01	0.5	30	5A	2.63"	4.50"	1.50"	.25
091-22F-5	Auto Current F-5	0.02	0.25	10	5A	2.63"	4.50"	1.50"	.25
091-22F-6	Auto Current F-6	0.02	0.10	4	5A	2.63"	4.50"	1.50"	.25
091-22-100-F	Auto Current F-100	0.0003	4	100	5A	2.63"	4.50"	1.50"	.25

Auto Current F-A

Features

- Senses current
- Auxiliary input, ground to operate
- Provides remote indication
- Simplifies vehicle wiring
- Flashing output to warning indicator light
- Single indicator operated from many inputs



The Auto Current F-A is an Auto Current F with an auxiliary input, which when grounded causes the output relay to operate. When the output relay is energized, it cycles ON and OFF producing a flashing signal. The Auto Current portion senses current permitting use as open door detector. The auxiliary input may be connected to any number of switches in parallel. Closing any switch or current sensing operates the Auto Current F-A. This feature makes it ideal as a detector for a door open "DO NOT MOVE VEHICLE" indicator. As with the standard Auto Current, these sense terminals are wired in series with the power supplied to the compartment lights.

Note: Standard unit supplies +12V to indicator. Available as -G for operating indicator by grounding.

Part Number	Description	Electrical Data			Switch Rating 12V	Dimensions			Wgt.
		Resistance Ohms	Min. Operating Amps	Max. Operating Amps		L	W	H	
091-22F-A	Auto Current F-A	0.01	1.0	30	5A	2.63"	4.50"	1.50"	.25
091-22F-A-6	Auto Current F-A-6	0.2	0.10	4	5A	2.63"	4.50"	1.50"	.25

OVER & UNDER VOLTAGE RELAYS

UV OV Relay

Features

- Monitors battery system voltage
- Detects under voltage and warns possible dead battery
- Easy-to-use program switches set under voltage trip point
- Detects over voltage and warns of possible battery boil over
- Provides relay contacts for over voltage and under voltage



The UV-OV Relay Precise - Programmable Voltage Detector monitors battery voltage and detects both over voltage and under voltage conditions. The under voltage trip point is programmed by the use of 3 "DIP" switches, which provide possible settings ranging from 11.44 Volts to 13.01 Volts. Over voltage trip point programming is done similarly with 8 possible settings ranging from 13.66 Volts to 15.06 Volts. These "DIP" switches are easily accessed by removing a snap-on window cover at the top of the unit. Heavy duty, relay contacts are provided for both conditions which may be wired to warning devices indicating abnormal conditions. Three LED indicators are provided under the snap-on cover for system trouble shooting, yellow for under voltage, green for normal, and red for over voltage.

Part Number	Description	DC Volts	Under Voltage Program Range	Over Voltage Program Range	Dimensions			Wgt.
					L	W	H	
091-45	UV OV Relay	10 to 17	11.44 to 13.01V	13.66 to 15.06V	1.50"	3.50"	4.25"	.5

OV Relay

Features

- Monitors battery system voltage
- Detects over voltage and warns of potential battery overcharge/boil over condition
- Relay contacts close when over voltage is sensed and ties to alarm
- Easy installation



The 091-108-012 Over Voltage Relay continuously monitors the voltage of the battery. The unit is factory set to actuate at 17 volts, and reset at 14 volts, and may be adjusted to other voltage trigger points. The output relay is capable of switching 30 Amperes, and both "Normally Open" and "Normally Closed" contacts are provided.

Part Number	Description	Electrical Data				Dimensions			Wgt.
		DC Volts	DC Amps	Input Amps Relay ON	Input Amps Relay OFF	L	W	H	
091-108-012	OV Relay	12	30	.08	.015	1.55"	4.50"	2.95"	.25

Low Voltage Alarm / 1901

Features

- Detects low battery voltage
- Programmed 120 second time delay
- High current relay, 30A
- Operates any indicator or alarm
- Meets NFPA 1901 requirements



The Low Voltage Alarm / 1901 detects when battery voltage drops below a threshold and remains low for 120 seconds. At that time, a relay is energized activating a low voltage indicator or alarm. Available for either 12 or 24V electrical systems, the unit contains LED indicators: to aid in installation and test. A green indicator is illuminated whenever the voltage is normal. When the voltage drops below the setpoint and remains low for 120 seconds, the green LED is extinguished and the red LED illuminates. The setpoint and time delay features meet the requirements of NFPA 1901, paragraph 9-3-3. Voltage setpoint is adjustable to meet special requirements

Easily installed, the Low Voltage Alarm requires only two wires to sense the battery voltage. The 30A contacts on the relay provide ample capacity to operate the low voltage alarm and indicator. Availability of a normally closed contact in addition to the normally open contact permits a wide variety of connections in the load circuit.

Part Number	Description	Electrical Data		Load Shed Factory Set Point	Dimensions			Wgt.
		DC Volts	DC Amps		L	W	H	
091-85-12	Low Voltage Alarm, 12V	12	30	11.8V	2.95"	5.10"	1.55"	.25
091-85-24	Low Voltage Alarm, 24V	24	30	23.6V	2.95"	5.10"	1.55"	.25
091-85-12/24	Low Voltage Alarm, 12V/24V	12/24	30	11.6V/23.2V	2.95"	5.10"	1.55"	.25

Alternate Action Relay

Features

- Remotely control a load from multiple locations
- 30A contacts
- Signal output to indicator light identifies position of relay
- Easy installation



The Alternate Action Relay allows to remote turn ON and OFF by grounding an input to the relay. The application of a ground energizes the relay and turns the load "ON". A second input to the same terminal de-energizes the relay and turns the load "OFF". Both inputs may come from the same switch or from any number of switches in parallel. Thus a load may be turned "ON" from one location and turned "OFF" from another. An output signal on the Alternate Action Relay operates a remote indicator to indicate when the load is energized.

Part Number	Description	Electrical Data		Dimensions			Wgt.
		DC Volts	DC Amps	L	W	H	
091-98-12	Alternate Action Relay	12	30	2.63"	4.00"	1.50"	.25

Time Delay - DODO

Features

- 30A contacts
- Relay closes immediately and remains closed for a time period after being de-energized
- Time delay, field adjustable
- Easy installation



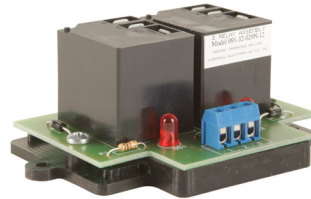
Time Delay Relay keeps a load energized for set time interval after the load is de-energized. A typical application is control of vehicle interior lighting to permit operators time for cleaning or maintenance. 30 amperes, both normally open and normally closed output contacts are provided. The device requires 3 input connections. +12V power and ground to operate the relay and a +12V signal. When the signal is applied, the relay closes immediately. When the signal is removed, the relay remains energized for the length of time interval. Five models are available ranging in delay times from 2 seconds to 60 minutes. Time delay on each model is field adjustable with a defined range to match the application.

Part Number	Description	Electrical Data		Settings			Dimensions			Wgt.
		DC Volts	DC Amps	Min.	Max.	Set Point	L	W	H	
091-103-012-A	Time Delay Relay - A	12	30	1.5 min.	6 min.	3 min.	2.63"	4.50"	1.50"	.25
091-103-012-B	Time Delay Relay - B	12	30	6 min.	27 min.	15 min.	2.63"	4.50"	1.50"	.25
091-103-012-C	Time Delay Relay - C	12	30	12 min.	60 min.	30 min.	2.63"	4.50"	1.50"	.25
091-103-012-D	Time Delay Relay - D	12	30	4 sec.	15 sec.	10 sec.	2.63"	4.50"	1.50"	.25
091-103-012-E	Time Delay Relay - E	12	30	2 sec.	3.3 sec.	2 sec.	2.63"	4.50"	1.50"	.25
091-103-012-F	Time Delay Relay - F	12	30	.5 sec.	1.8 sec.	1 sec.	2.63"	4.50"	1.50"	.25

Relay Board 2 and Relay Board 4

Features

- Available with 2 or 4 relays
- 30A contacts
- LED's indicate when relay is energized
- Normally closed and open contacts
- Use with Load Manager
- Easy installation



Choose either a two or four relay that simplifies installation and wiring. Relays are mounted and energized individually from power supplied through the terminal strip. LED indicators adjacent to each relay illuminate whenever the relay is energized. Load circuits are connected directly to the top of the relays with 1/4 inch quick disconnect terminals. By installing this one assembly, the complexity of mounting multiple individual relays is reduced and much of the wiring to the relay coils is eliminated. Operation by either supplying voltage to the relay or grounding the relay coil. Models are available in 12 and 24V.

Part Number	Description	# of Relays	Electrical Data		Com. Connection	Input to Operate	Dimensions			Wgt.
			DC Volts	DC Amps			L	W	H	
091-32-029N-12	2 Relay Board	2	12	30 per relay	12V	Ground	1.45"	3.75"	2.60"	.25
091-32-029P-12	2 Relay Board	2	12	30 per relay	Ground	12V	1.45"	3.75"	2.60"	.25
091-32-029N-24	2 Relay Board	2	24	30 per relay	24V	Ground	1.45"	3.75"	2.60"	.25
091-32-029P-24	2 Relay Board	2	24	30 per relay	Ground	24V	1.45"	3.75"	2.60"	.25
091-32-024N-12	4 Relay Board	4	12	30 per relay	12V	Ground	1.55"	3.50"	4.75"	.5
091-32-024P-12	4 Relay Board	4	12	30 per relay	Ground	12V	1.55"	3.50"	4.75"	.5
091-32-024N-24	4 Relay Board	4	24	30 per relay	24V	Ground	1.55"	3.50"	4.75"	.5
091-32-024P-24	4 Relay Board	4	24	30 per relay	Ground	24V	1.55"	3.50"	4.75"	.5

PDS - 100

- 100A Power Distribution System
- Simplifies Wiring of Electronic Accessories

Features

- Quick and easy way to connect, protect, and program power to emergency vehicle accessories
- Provides 6 dedicated fused circuits configured in 3 load group to power radios, emergency lights, siren, video, MDT, radar, and more
- Flexible circuit activation/deactivation allows installer to set battery power use priority independently per 2 circuit Load Group:
 - Powered Only With Ignition
 - Timed Disconnect
 - Always On With Load Group LVD
 - Always On, No Load Group LVD
- Each circuit is fuse protected with LED indicator which identifies the blown fuse position, simplifying trouble shooting
- Master Low Voltage Disconnect protects batteries from extreme discharge
- Heavy duty studs for battery connections
- Screw terminals for secure load connections
- Increase circuit capacity by wiring multiple PDS using parallel busing kit



Specifications

Input: 12V, neg. ground

Power Consumption: Idle: 8mA, Active: 180 mA/circuit

Maximum Load per PDS: 100A, 20A max. per fuse position

Maximum Load Per System: 3 PDS wired in parallel, 18 circuits

Fuse Type: ATC/ATO (not included)

Programmable Shutdown per Load Group: 2 min. – 13 hours

Disconnect Range: 11.8 - 10.6V DC

Master Low Voltage Disconnect: @ 10.5V (factory programmable 10.0 - 11.8V)

Case: Powder coated aluminum

Bus: Nickel plated copper

Protective Cover: Top panel connections and switches

Part Number	Description	Circuits	Max Loads	Dimensions			Wgt.
				L	W	H	
390-5711-0	PDS-100	6	100A Total, 20A Per Position	6.20"	5.20"	2.00"	2

INSTALLATION ACCESSORIES



Mounting Plate for
Auto Eject WP
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Mounting Plate for
Super Auto Eject
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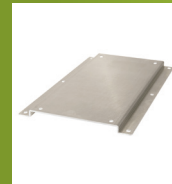
Mounting Plate for
Air Eject, 12V
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Mounting Plate for
Super 30 Auto Eject
Page 81



Mounting Plate for
Super 16 Auto Eject
Page 81



Charger
Mounting Plates
Page 81



Air Compressor
Mounting Plates
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Waterproof
Circuit Breakers
Page 82



High Current
ANL Fuses
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Waterproof
Junction Boxes - PS
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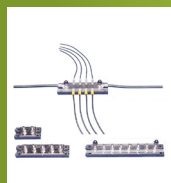
Weatherproof
Junction Boxes - BX
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Waterproof Fittings
RA Series
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Waterproof Fittings
CCX Series
Page 84



Bus Bars
Page 84



Terminal Strips
Page 84

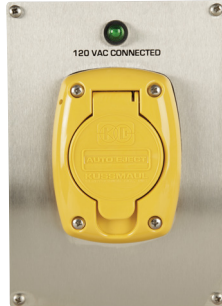
MOUNTING PLATES

Auto Eject Plates

- Simplifies Installation of Cord and Air Ejects
- Green Light Indicates When Inlet is Energized
- Heavy Duty Stainless Steel Plate, Paint to Match Vehicle



091-185-010
for Auto Eject WP



091-185-009
for Super Auto Eject



091-182-027-120
for Super 16 Auto Eject
120 Vac

091-182-027-240
for Super 16 Auto Eject
240 Vac



091-159-081-120
for Super 30 Auto Eject
120 Vac

091-159-081-240
for Super 30 Auto Eject
240 Vac



091-185-011
for Air Eject, 12V

091-185-013
for Air Eject, 24V

Charger / Pump Mounting Plates

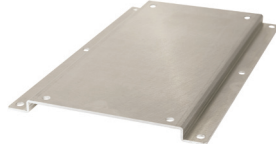
- Simplifies Installation and Removal
- 1/8" Aluminum with Charger and Vehicle Mounting Holes
- Pump Plates Have Integral Vibration Mounts

Charger Mounting Plates



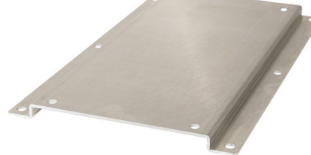
091-185-006
E-Z Mounting Plate
Small

- Auto Charge 11
- Auto Charge 12
- Euro Charge I
- Euro Charge II
- Pump Plus HO



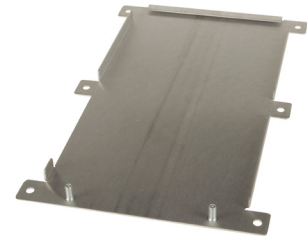
091-185-007
E-Z Mounting Plate
Medium

- Auto Charge 20
- Auto Charge 12 HO
- Auto Charge 12 PIM
- Euro Charge III



091-185-008
E-Z Mounting Plate
Large

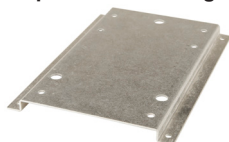
- LPC 40
- Auto Charge 1200
- Auto Charge 1200 Remote
- Auto Charge D, D2
- Auto Charge 4000
- Pump Plus 1200
- Auto Charge D Pump Plus



091-200-EZM
E-Z Slide Mount Plate
Large

- LPC 40
- Auto Charge 1200
- Auto Charge 1200 Remote
- Auto Charge D, D2
- Auto Charge 4000
- Pump Plus 1200
- Auto Charge D Pump Plus

Air Compressor Mounting Plates



Part Number	Description
091-9-12V-HP-H	Auto Pump 12V & 12V HP Mounting Plate
091-9H-1	Auto Pump AC Mounting Plate
091-9HP-H	Auto Pump AC HP Mounting Plate

• Waterproof, High Amperage Surface Mount Circuit Breakers

Features

- Combines switching and circuit breaker function in one unit
- Compact size and surface mount configuration protects high amperage circuits
- Trip delay curve accommodates high surge amperage for motor start
- Push to disconnect button de-energizes circuit for maintenance
- Latch arm resets breaker after overload, but cannot be held in "ON" position if short remains on circuit
- 1/4" terminal studs with protective covers
- Waterproof - ideal for marine and truck applications
- Ignition protected for safe use in gasoline powered applications
- High impact plastic molded case
- 2 ea. 1/4" holes, mounting hardware not provided
- Thermal trip sensing



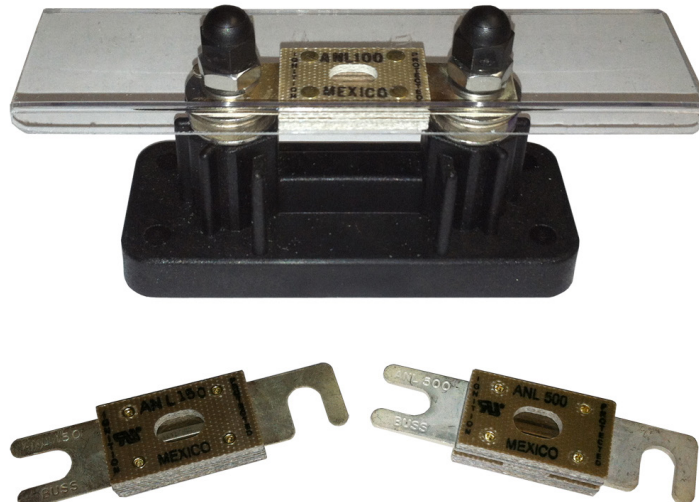
Part Number	Description	Volts	Amps	Max Interrupt Current	Dimensions			Wgt.
					L	W	H	
090-0030-0	WBS-30	42V	30A	3000A	2.88"	1.88"	1.75"	.25
090-0050-0	WBS-50	42V	50A	3000A	2.88"	1.88"	1.75"	.25
090-0080-0	WBS-80	42V	80A	3000A	2.88"	1.88"	1.75"	.25
090-0100-0	WBS-100	42V	100A	3000A	2.88"	1.88"	1.75"	.25
090-0120-0	WBS-120	42V	120A	3000A	2.88"	1.88"	1.75"	.25
090-0150-0	WBS-150	42V	150A	3000A	2.88"	1.88"	1.75"	.25

• High Current ANL Fuses / Fuse blocks

Essential safety item for all inverter installations and other high amperage DC circuit over-current protection.

Features

- Heavy duty 500A , insulated, compact fuse block with corrosion resistant 5/16" studs
 - Secures to surface with two #10 flat head screws or bolts (not included)
 - Clear lexan cover insulates conductive parts
 - Accepts industry standard ANL tin-plated copper fuses, purchase separately. 100-500A ratings
 - See through mica element in fuse body for easy identification of blown link
- Case Sizing: 6.25" x 3.00" x 2.00"



Part Number	Description
100-4407-5	AFB-500, Fuse Block
100-0XXX-0	ANL Fuse, specify amperage: 100, 150, 200, 250, 300, 350, 400, 500
All ANL fuses rated to 80V DC	

• PX Series Waterproof Junction Boxes

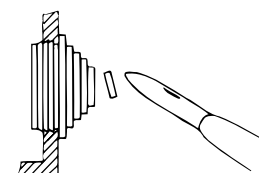
Features

- Ideal for wiring connections onboard emergency vehicles where subject to outside conditions
- Made from rugged, non-corrosive, high impact polypropylene
- Snap-on cover provides watertight seal
- "Universal" cut-to-fit (see diagram) graduated diameter cable entries accommodate wide cable range
- Multiple position connects stripes with "captive" screw compression wire terminals installed
- Multiple knockouts provided for conduit access (in addition to cable entries)
- IEC Waterproof Rating: IP54 - "Water projected in jets against the enclosure from any direction shall have no harmful effects"



Part Number	007-3001-0	007-3002-0	007-3003-0
Description	PX-1	PX-2	PX-3
Number of Connector Strips	1	2	2
Positions per Strip	6	6	9
Max Wire Gauge	16	16	16
Number of Cable Entry Points	5	7	7
Number of Cable Entries Installed	3	7	7
Spare Cable Entries Provided	2	0	0
Cable Diameter Range (Inches)	0.14 - 0.81	.014 - 0.81	0.14 - 0.99
Cable Diameter Range (mm)	3.5 - 20.5	3.5 - 20.5	3.5 - 25.5
Box Size	2.95" x 2.95" x 1.66"	3.35" x 3.35" x 1.66"	4.45" x 4.45" x 2.29"

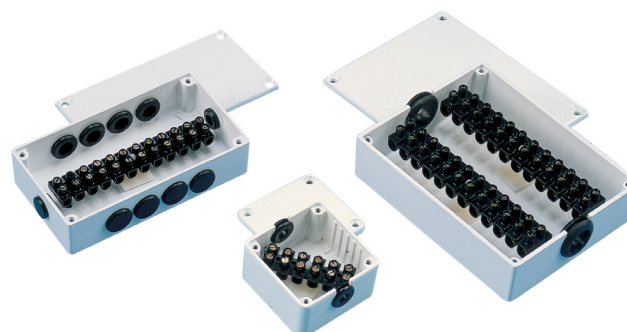
Graduated Diameter Flexible Cut-to-fit Entries



• BX Series Weatherproof Junction Boxes

Features

- Provides secure, weatherproof protection of wiring connections
- Rugged cast aluminum box with white enamel finish
- Easy wiring access through multiple grommated cable entries
- Removable connector strips secure conductors with compression screws - no terminals required, see matrix below for number of connector positions and wire gauge



Part Number	007-6001-0	007-6002-0	007-6003-0
Description	BX-1	BX-2	BX-3
Number of Connector Strips	1	1	2
Positions per Connector Strip	6	12	11
Max Wire Gauge	16	16	14
Max Amps (per position)	6	6	10
Cable Entry Points	2	8	2
Max Cable Diameter	0.25"	0.37"	0.59"
Box Size	2.0" x 2.0" x 1.2"	4.4" x 2.4" x 1.2"	4.7" x 3.7" x 1.3"

Waterproof Fittings - RA Series Right Angle

Features

- Route cables at 90° through vertical and horizontal surfaces low profile design that keeps cable secured close to the surface
- Molded of nylon, the Sculpted shape has no sharp edges and provides radiused 90° feed-thru bend in cables without damage
- Easy installation: slide silicone compression rings on cable, mount base piece with waterproof gasket then attach sealing end cap to create an IP 65 waterproof seal

Part Number	Description	Cable Diameter Range	Dimensions (Inches)
007-2010-0	RA-1	0.1" - 0.25"	2.17 x 1.65 x 0.63
007-2020-0	RA-2	0.27" - 0.35"	3.23 x 2.44 x 0.95
007-2030-0	RA-3	0.39" - 0.47"	3.23 x 2.44 x 0.95



Waterproof Fittings - CCX Series

Features

- Create a 100% waterproof seal when routing cables vehicle roofs
- Allowing installation/removal with connector still attached
- Entry hole pre-drilled in seal with slit to edge allowing feed-thru of cable with factory installed connector attached

Part Number	Description	Cable Diameter Range	Max Connector Diameter	Dimensions	
				Dia.	Height
007-2003-0	CCX-R	0.47"-0.59"	1.57"	2.59"	.83"
007-2004-0	CCX-S	0.35"-0.55"	.83"	1.77"	.83"
007-2005-0	CCX-T	0.18"-0.35"	.83"	1.93"	.75"

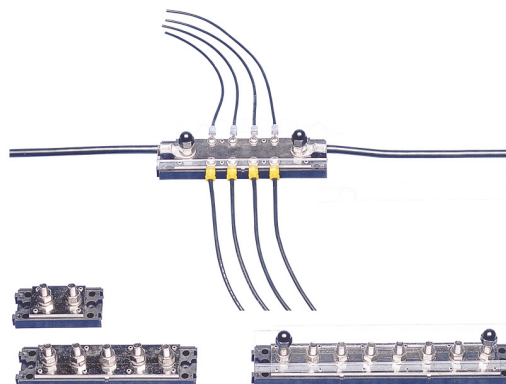


Bus Bars

Features

- Heavy duty, 500A with 5/16" studs on 1" centers in 1/4" thick nickel plated, copper bar
- A clear insulating protective cover is provided

Part Number	Description	Quantity of 5/16" Studs	Dimensions	
			L	W
002-3595-2	BB-2, Bus Bar	2	3.063"	1.50"
002-3595-0	BB-2/8, Bus Bar	2 plus 8 - #8 screws	6.063"	1.50"
002-3595-5	BB-5, Bus Bar	5	6.063"	1.50"
002-3595-8	BB-8, Bus Bar	8	9.063"	1.50"



Terminal Strips

Features

- 100A Dual terminal strips with #8 screws on 3/4" centers

Part Number	Description	# of Terminals	Dimensions	
			L	W
064-3589-1	TS-2x4, Terminal Strip	8	3.00"	1.50"
064-3589-2	TS-2x8, Terminal Strip	16	6.00"	1.50"



SECTION 10

ENGINE / VEHICLE ACCESSORIES



Auto Reel
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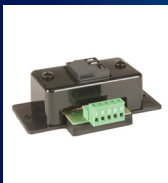
Power Cord Reel
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Air Line Reel
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R.F. Control
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Safety Lock
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Safety Lock 3
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Safety Lock 4
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Safety Lock D
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Phone-Com Intercom
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Auto Throttle 1
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7 Door Display
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10 Door Display
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Relay Output
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Audible Annunciator
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USB Dual Port
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Data Port
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Auto Touch
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Temperature Monitor
Page 93



Shoreline Alarm
Page 93



• AC Cord Reel with Auto Retract

Auto Reel

Features

- Upon the Auto Eject discharge of the connector, the Auto Reel automatically retracts cord to a predetermined stop
- Eliminates damage to plug and cord from vehicles movement
- With the Auto Safe option: once cord is disconnected the power is shut off to prevent electric shock if cord is severed or gets wet
- Spring retractable with latch
- Wall or ceiling mount
- 45 foot, #12 AWG 3 conductor cord
- Adjustable cord stop



Part Number	Description	Electrical Data		Dimensions			Wgt.
		AC Volts	Amps	L	W	H	
091-220-20-120	Auto Reel	120	20	12.00"	14.00"	10.00"	28
091-220-20-120-AS	Auto Reel w/ Auto Safe	120	20	12.00"	14.00"	10.00"	28

Power Cord Reel AC Cord Reel for Auto Ejects



Features

- Spring retractable with latch
- Wall or ceiling mount
- 45 foot, #12 AWG 3 conductor cord
- Adjustable cord stop
- NEMA 5-20P connector attached, mates with 20 amp Auto Eject

Part Number	Description	Wgt.
L4545 12 3 3	Power Cord Reel	28

Air Line Reel Air Line Reel for Air Ejects



Features

- Spring retractable with latch
- Wall or ceiling mount
- 50 foot, 1/4 inch, 300 PSI hose
- Adjustable cord stop
- Female coupler supplied to mate with Air Eject

Part Number	Description	Wgt.
RT450-OLP	Air Line Reel	25

- **Activate Up to 4 In-Building Functions from Vehicle**
 - **Garage Doors**
 - **Exhaust Fans**
 - **Vehicle Bay Lighting**
 - **Traffic Lights**

Features

- Vehicle mounted transmitters generate 4 unique signals
- Typical transmitter range: 155 feet
- Station mounted AC powered receiver actuates up to 4 in building systems/accessories
- Multiple transmitter codes permits: setting unique frequencies for up to 32 vehicles, allows assigning dedicated controls per vehicle per single bay or area
 - Setting unique frequencies for up to 32 vehicles, allows assigning dedicated controls per vehicle per single bay or area
 - Set common station activation frequency for all vehicles
- Code entry via dip switches



Transmitter



Receiver

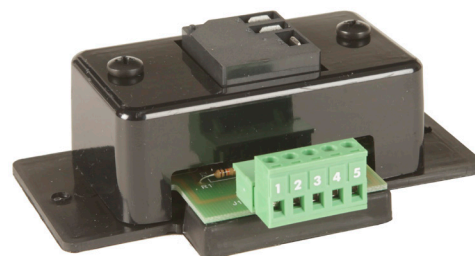
Part Number	Description	Electrical Data		Output Channels	Trans. Codes	Dimensions			Wgt.
		Input Power	Frequency			L	W	H	
091-133-T	Transmitter	12V, 0.015A	418 MHz	120	4	2.95"	4.5"	1.55"	1
091-133-R	Receiver	12V, 50/60 Hz. 0.015A	418 MHz	120	4	4.75"	3.5"	1.55"	1

SAFETY LOCKS

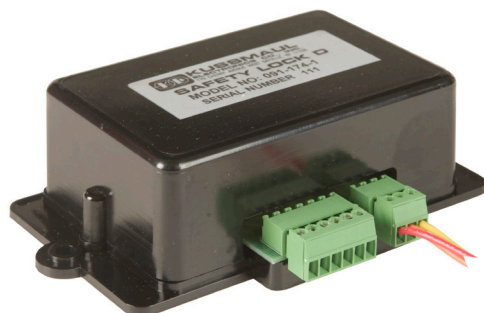
- Permits Running Engine with Ignition Key Removed
- Prevents Unauthorized Drive Away of Vehicles Left Unattended with Engine Running

Features

- Safety lock activated when ignition key removed
- When safety lock activates, engine remains on and shuts down automatically if controls are manipulated in attempts to move vehicle
- Select models to provide single or multiple ignition outputs:
 - Foot brake
 - Parking brake
 - Gear shift
 - Other installer defined kill switch activation
- Safety lock override/re-start when ignition key is inserted
- 30A relay contacts



Safety Lock
091-148-12
Single Wire Ignition Output



Safety Lock D
091-174
For Chrysler / Jeep / Dodge Vehicles



Safety Lock 3
091-155
Three Wire Ignition Output



Safety Lock 4
091-160
Four Wire Ignition Output

Part Number	Description	Electrical Data		Dimensions			Wgt.
		Volts	Outputs	L	W	H	
091-148-12	Safety Lock	12V	1	2.63"	4.50"	1.50"	.25
091-155	Safety Lock 3	12V	3	4.25"	3.50"	1.63"	.25
091-160	Safety Lock 4	12V	4	3.00"	5.25"	1.50"	.25
091-174	Safety Lock D	12V	*	2.95"	5.10"	1.55"	.25

* For Chrysler Vehicles

PHONE-COM INTERCOM AND AUTO THROTTLE 1

- **Direct Wired Point-to-Point Communications in Vehicles and Trailers**
- **Ideal for Communication Between Driver and Passenger Compartment in Ambulance**

Features

- Call button on sending station activates light and buzzer at receiving station
- 12V operation
- 2 station system available as complete install kit;
 - 40' interconnect wire
 - Terminals
 - Fuses



Model: 117-1010-0



Model: 117-1002-5



Model: 117-1010-1

Part Number	Description
117-1002-5	PI-2 Black, two station phone with single call button
117-1002-8	PI-2 White, two station phone with single call button
117-1010-5	PI-10 Black, multi-station phone with 10 call buttons
117-1010-8	PI-10 White, multi-station phone with 10 call buttons
117-1022-5	PI-2 Set Black, two station phone set with 40' interconnect wire, fuse, lugs, and mounting hardware
117-1022-8	PI-2 Set White, two station phone set with 40' interconnect wire, fuse, lugs, and mounting hardware
117-0100-0	Buzzer for all model Phone-Com

- **High Idle Control Automatically Increases Alternator Output**

Features

- Time delay eliminates cycling
- Usable with any throttle actuator
- Simple, easily installed

The Auto Throttle 1 is a voltage detector, designed to operate any throttle system, to increase engine speed when insufficient alternator output drops the battery voltage. Time delays are provided to inhibit the unit from operating, when the voltage drops for only a short period of time. Then, once a high idle is produced, it is maintained for 5 minutes. This reduces the ON/OFF cycling.

The output of the Auto Throttle 1 is the closure of a relay, with 20 ampere contacts. This contact closure may be utilized to operate any actuator, or switch the input to an electronic engine control. Operation occurs when the unit senses less than 12.5 volts, for a minimum of 15 seconds. The relay then operates, to produce the high idle, and remains energized for at least 5 minutes, or until the voltage rises above 13.4 volts, whichever occurs later.

The Auto Throttle 1 senses battery voltage, and provides the necessary control signals to speed up the engine. It does not provide the mechanism to increase the speed. This is supplied by the installer.



Part Number	Description	Electrical Data Specs		High Idle Factory Set Point	Dimensions			Wgt
		DC Volts	DC Amps		L	W	H	
091-84	Auto Throttle 1	12	30	12.5V	5.10"	1.55"	2.95"	.25

OPEN DOOR DISPLAY ALARM SYSTEM

- Red LED's Alert Driver to Door Open/Ajar Condition Enhancing Safety
- Monitor Up To 10 Doors/Compartments
- Audio Alarm Panels Optional

Features

- Choose 10 or 7 door LED display
- Door/compartments mounted switches feed signal to display (switches installer provided)
- Audible alarm options
 - In dash buzzer
 - In-dash panel with relay for remote high decibel warning device (3A max.)
- Customize panels with vehicle manufacturer name/logo
- 1.02" x 1.98" compact panel face, mounts in standard switch opening

Open Door Indicator Panels



Optional Audible Alarms



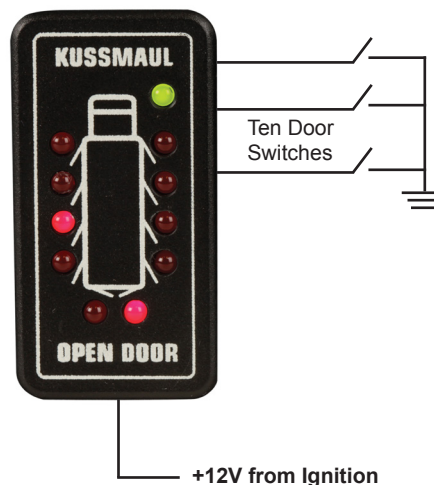
Relay Output
091-178-9



Audible Annunciator
091-178-8

- Remote audible alarm relay panel
 - Wires to open door indicator panel
 - Contains relay that actuates remote audible alarm, installer provided
- In-Dash audible alarm panel
 - Wires to open door indicator panel
 - Contains audible buzzer

Typical Indicator Installation



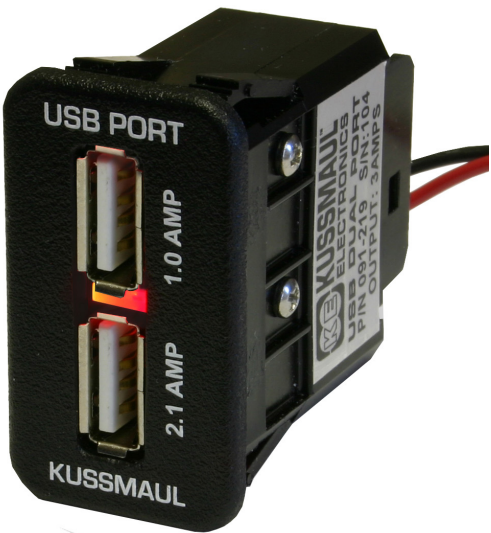
Part Number	Description	Input Power	Dimensions			Wgt.
			L	W	H	
091-178-10A	10 Door Display	12V	1.98"	1.02"	0.45"	1
091-178-7A	7 Door Display	12V	1.98"	1.02"	0.45"	1
091-178-8	Audible Annunciator	12V	1.98"	1.02"	0.45"	1
091-178-9	Relay Output	12V	1.98"	1.02"	0.45"	1

USB DUAL PORT AND DATA PORT

- **3.1 Amps Max Output Allows Charging Of Both An iPad And iPhone At The Same Time**

Features

- Dual USB Charging Ports
- Quick and easy way to recharge electronic devices in a vehicle
- Built-In LED Indicator indicates device is powered
- Designed for easy installation in vehicle switch panels
- Reverse polarity protected
- Can be connected to 12V switched ignition or directly to battery



Part Number	Description	Electrical Data			Dimensions			Wgt.
		Input Volts	Output Volts	Output Amps	L	W	H	
091-219	USB Dual Port	11-16 Vdc	5.0 Vdc	3.1 Amps	1.73"	0.98"	1.73"	.25
091-219-4	USB Dual Port	11-16 Vdc	5.0 Vdc	4.2 Amps	1.73"	0.98"	1.73"	.25
091-219-4N	USB Dual Port	11-16 Vdc	5.0 Vdc	4.2 Amps	1.97"	1.02"	1.79"	.25

- **Provides Access To Router**

Features

- Provides access to router
- Designed for easy installation in vehicle switch panels
- Standard RJ45 Connector
- Category 3, 5E, 6, & 6A performance
- EIA/TIA 568A/B compliant ensuring compatibility and reliability
- Fully stamped shielding offers isolation from EMI/RFI



Part Number	Description	Connectors	Category	Temperature Range	Dimensions			Wt.
					L	W	H	
091-227	Data Port	RJ45	3, 5E, 6 & 6A	-50°F to +150°F	1.73"	0.98"	1.73"	0.25

AUTO TOUCH AND TEMPERATURE MONITOR

• Low-Side Touch Sensitive Switch

Features

- Touch-On / Touch-Off switch
- Built-in LED illuminates when switch is on
- Lexan front panel for years of durability
- Reverse polarity protected
- Designed for easy installation in vehicle switch panels
- Available as toggle or momentary operation
- When ordered as a toggle switch:
 - place finger on ON/OFF area to toggle on and repeat to toggle off
- When ordered as a momentary switch:
 - place and hold finger on ON/OFF area to turn on

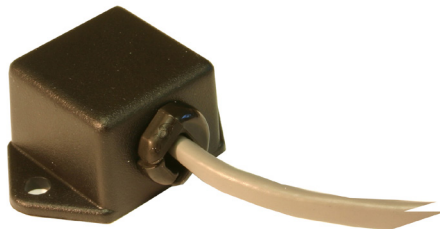


Part Number	Description	Electrical Data			Dimensions			Wgt.
		DC Volts	Quiescent Current	Switch Rating	L	W	H	
091-222	Auto Touch, Toggle Switch	8-20	0.020 Amps Max	5.0 Amps Max	1.73"	0.98"	1.73"	.25
091-222-MOM	Auto Touch, Momentary Switch	8-20	0.020 Amps Max	5.0 Amps Max	1.73"	0.98"	1.73"	.25

• Monitors Temperature

Features

- Designed for easy installation in vehicle switch panels
- Large 7 segment green LED display
- Reverse polarity protected
- Easy connection to 12V switched ignition
- Blinks at 32° F and below to indicate roads may be icy



Remote Sensor with 16' cable included with Temperature Monitor



Part Number	Description	Electrical Data		Dimensions			Wt.
		DC Volts	DC Amps	L	W	H	
091-224	Temperature Monitor °F	12	0.25A	1.73"	0.98"	1.73"	0.25
091-224C	Temperature Monitor °C	12	0.25A	1.73"	0.98"	1.73"	0.25

SHORE POWER ALARM AND BLUETOOTH MODULE

- Shore Power Alarm
- Audible Alarm And Led Alert Driver To Shore Power Connected

Features

- 85 dB alarm
- Built-in LED indicator
- Designed for easy installation in vehicle switch panels
- Reverse polarity protected
- Audible alarm sounds and LED illuminates when shore power is connected and vehicle is running



Part Number	Description	Electrical Data		Dimensions			Wgt.
		DC Volts	DC Amps	L	W	H	
091-231-E	Shore Power Alarm, Eaton Euro	10-16	30mA	1.98"	1.02"	0.45"	.25
091-231-N	Shore Power Alarm, Eaton NGR	10-16	30mA	1.98"	1.02"	0.45"	.25
091-231-S	Shore Power Alarm, Eaton SVR	10-16	30mA	1.73"	0.98"	1.73"	.25

- Wireless Audio Via Any Cell Phone

Features

- Provides a fully integrated solution for delivering high quality stereo audio in a small form factor.
- Fully certified Bluetooth version 3.0 audio module, fully compatible with Bluetooth version 2.1+EDR, 1.2, and 1.1
- Dual-channel, differential audio output for highest quality audio
- FCC Certification
- Bluetooth SIG Certified
- Profiles include HSP/HFP, A2DP, AVRCP, SPP, and iAP
- Operation Range is 10 meters (33 feet)
- Designed for easy installation in vehicle switch panels
- Easy connection to 12V switched ignition



Part Number	Description	Electrical Data		Dimensions			Wt.
		DC Volts	DC Amps	L	W	H	
091-226	Bluetooth Module	11-16V	0.25A	1.73"	0.98"	1.73"	.25

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Kussmaul Product Support

To: All Our Valued Customers

Please contact us regarding any questions or clarifications regarding product selection, installation, function etc. Our knowledgeable and experienced staff is well versed in emergency vehicle electrical systems, components and product applications. We are developing a cad library to facilitate any engineering process, check our web site for current availability.

If you experience trouble with one of our products, below is a brief and simplified summary of how you can depend on us to support products that are in service. For your reference, our complete warranty statement can be viewed on line.

If you are having trouble with any of our products please contact us at **800-346-0857**. In many cases one of our knowledgeable techs can trouble shoot and resolve the problem over the phone. If you need to send the unit in for service, please visit the Parts Return section on our website, **www.kussmaul.com** and follow the instructions. Once received at our facility, our staff is committed to repairing and returning it to you within 3 days. If you need it sooner, we can arrange same day turn around and expedited shipping.

Battery Chargers:

If your charger has been in service for less than 3 years, we will perform the repairs at no charge, including return shipping. If your charger is more than 3 years old, we have a flat rate repair fee, and support our repair work with a 6 month warranty. We have been producing chargers for 48 years and replacement parts are no longer available for some models, in which case we will offer you a trade in allowance towards a new unit.

Auto Ejects:

If your Auto Eject is in service for less than 2 years, we will perform the repairs at no charge, including return shipping. If your Auto Eject is more than 2 years old, we have a flat rate repair fee, and support our repair work with a 6 month warranty.

Air Compressor Pumps:

If your Air Compressor is in service for less than 1 year, we will perform the repairs at no charge, including return shipping. If your Air Compressor is more than 1 year old, we have a flat rate repair fee, and support our repair work with a 3 month warranty. These pumps can be rebuilt by either our tech staff or we can supply you with a rebuilding kit.

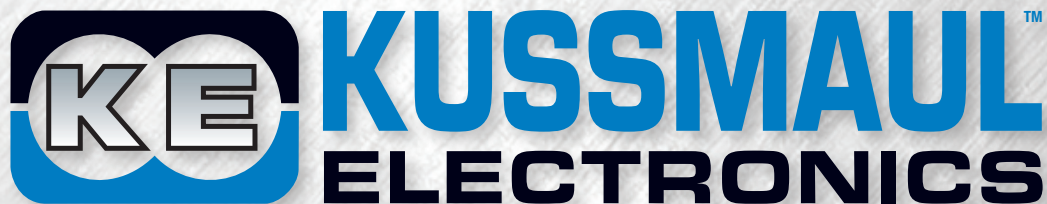
Electronic Displays Accessories:

Displays and indicators utilize long life LED's and rarely need replacement. If a malfunction does occur, some can be repaired others need to be replaced. Contact us and we will advise you the best course of action. If malfunction occurs within 3 years of installation we will replace or repair free of charge. Other accessories products contain relays, which may wear over time and can be repaired. These too will be repaired at no charge with in 3 years.

We remain always at your service.



Thomas H Nugent, President



ENERGIZED AND READY, WHEN SECONDS COUNT

SECTIONS

1) Battery Charging



Battery Chargers
Battery Savers

6) Solar Power Charging



2) Battery Indicators / Meters

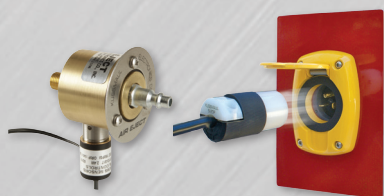


7) 120/240 VAC Volt Equipment



AC Power
Distribution Panels
Inverters

3) Ejection Units



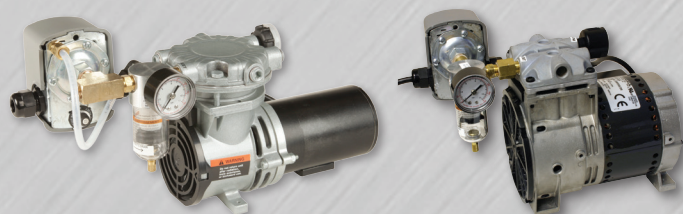
Electrical Plug
Air

8) DC Power Management



Relays
Distribution
Load Management
DC UPS

4) Air Compressors



9) Installation Accessories



Circuit Protection
Bus Bars /
Junction Boxes
Connectors

5) Kits And Packages



Pump Plus
Charger Kits

10) Engine / Vehicle Accessories



RF Transmitters
High Idle Kits
Cord Reels
Open Door Alarm