KUSSMAUL™ ELECTRONICS

ENERGIZED AND READY, WHEN SECONDS COUNT

2020 CATALOG

The Most Trusted Name In Rugged Electronic Power Products For Over 50 Years

Issue 124

MILESTONES

1967, was the year Ernest A. (Ernie) Kussmaul founded Kussmaul Electronics. A solution oriented company that eventually became the standard for power products in the Emergency Vehicle Market.

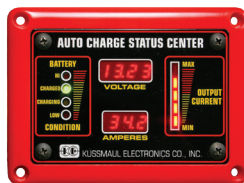## 1975

The first Kussmaul Battery Charger is born.

1980's

In 1985, the first Auto and Air Eject was introduced.

1990's

The first Automatic Load Shedding System was designed.

2000's

In the 2000's, the 30 AmpAuto Eject was introduced. The first decade of 2000, brought the Digital Status Center.

2015 - 2018

Growth continues in 2015, the first Battery Chargers with patented Parasitic Load Compensation (PLC) are developed. Dashboard Accessories, Solar Panels expanded the line and Super Auto Eject Deluxe Covers were introduced in 2018.

2020

More PLC technology to the new generation of Low Profile Battery Chargers and developments in Inverter Charging.

TABLE OF CONTENTS

KUSSMAUL ELECTRONICS
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800-346-0857 • email: sales@kussmaul.com
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BATTERY CHARGERS

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SINGLE BATTERY BANK SYSTEMS SELECTION CHART

SINGLE BATTERY BANK SYSTEMS

Legend:
- 🟥 Not Recommended
- 🟨 OK
- 🟩 Recommended
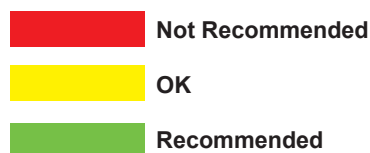
Average Battery Ratings — CCA: 700, Amp Hour: 100

DDEC Systems: Main Battery / Engine Battery

Color codes in table: **G** = Recommended (green), **Y** = OK (yellow), **R** = Not Recommended (red), blank = no rating

Charger Series	AMPS	PAGE	0	5	10	0	5	10	0	5	10	0	5	10	20	0	5	10
AUTO CHARGE																		
Auto Charge 12	12	9	G	G	Y	G	Y	R	R	R	R	R	R	R	R	R	R	R
Auto Charge 12HO	20	9		G	G	G	G	G	G	Y	R	R	R	R	R	R	R	R
Auto Charge 1200	40	13						G	G	G	G	G	G	G	R	R	R	R
LOW PROFILE																		
LPC 7	7	5	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R
LPC 20	20	7		G	G	G	G	G	G	Y	R	R	R	R	R	R	R	R
LPC 40	40	6						G	G	G	G	G	G	R	R	R	R	R
LPC 80	80	7							G	G	G	G	G	G	G	R	R	R
EV																		
EV-20	20	8		G	G	G	G	G	G	Y	R	R	R	R	R	R	R	R
EV-40	40	8		R	R		R	R	G	R	R	G	R	R	R	R	R	R
AUTO CHARGE - BATTERY SAVER																		
Auto Charge 1000	18	10	G	G	G	G	Y	R	R	R	R	R	R	R	R	R	R	R
Auto Charge 20/20	40	11						G		G	G	R				R	R	R
Auto Charge 35/10	45	14						G			G	G	G	Y		R	R	R
Auto Charge 40/20	60	15						G		G	G	G		G		R	R	R
Auto Charge D	33	20														G	G	G
WATERPROOF																		
WP-35	35			R	R		R	R	G	R	R	Y	R	R	R	R	R	R
PUMP PLUS																		
Pump Plus 1000 PLC	18	49	G	G	G	G	Y	R	R	R	R	R	R	R	R	R	R	R
Pump Plus 1200	40	50						G	G	G	G	G	G	R	R	R	R	R
AC D Pump Plus	33	53														G	G	G

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.

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BATTERY CHARGERS

DUAL BATTERY BANK SYSTEMS SELECTION CHART

DUAL BATTERY BANK SYSTEMS

DDEC Systems

Legend:
- Red — Not Recommended
- Yellow — OK
- Green — Recommended

Average Battery Ratings
CCA: 700
Amp Hour: 100

Main Battery
Engine Battery

Charger Series	AMPS	PAGE	0	5	10	0	5	10	0	5	10	0	5	10
Auto Charge														
Auto Charge 11	10	17	Green	Yellow	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Auto Charge 11HO	20	17		Green	Green	Green	Yellow	Red	Red	Red	Red	Red	Red	Red
Auto Charge / Battery Saver														
Auto Charge 2000 PLC	18	18	Green	Green	Yellow	Red	Red	Red	Red	Red	Red	Red	Red	Red
Auto Charge 4000	45	19			Green	Green	Green	Green	Green	Green	Yellow	Red	Red	Red
Auto Charge D2	33	20										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		Green	Green	Green	Green	Green	Green	Yellow	Red	Red	Red	Red
Pump Plus														
Pump Plus HO	11	52	Green	Yellow	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
Pump Plus 2000 PLC	18	51	Green	Green	Yellow	Red	Red	Red	Red	Red	Red	Red	Red	Red

Parasitic Loads in Amps (column header values repeated per battery system: 0, 5, 10)

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.

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

POWER 7 AMPS
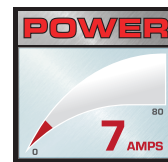
Features

- 7A for charging a single battery bank
- Three step charging: bulk, absorption, and float
- Lightweight, small low profile size
- Clean output poses no interference with radios and other mobile devices

- Gel Cell/Lead-Acid switch selects the optimum charge/float voltages based on the battery type
- Included Charger Status indicator light changes color according to the output
- Current limiting prevents damage from an overload
- Load activated cooling fan allows for continuous operation at full-rated output
- A Float/3 Step selector switch protects the batteries when charging under a continuous load
- Meets CE requirements
- Includes a heavy duty stainless steel case designed for emergency vehicle use

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

BATTERY CHARGERS

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BATTERY CHARGERS

Charge Single Battery Bank with Parasitic Load Compensation (PLC) for Power Sensitive Electronics Low Profile Case Fits in Tight Locations

LPC 40

NEW LPC 40, PLC Features

- Newly enhanced LPC 40A with patented PLC (parasitic load compensation) technology
- Clean output poses no interference with radios and other mobile electronics
- Includes a 15A auxiliary output circuit with a power source selector switch for operating accessory loads i.e., air compressor pumps, handheld lights or handheld radios
- Front panel connections for remote display and auxiliary loads
- Includes a heavy duty aluminum case designed for emergency vehicle use
- User Selectable:
  - Battery Type
  - 3 Step or Float
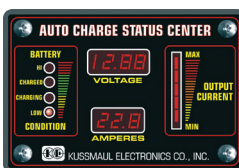 - 1, 5 or 10 hour timer
  - PLC

Remote Display Options

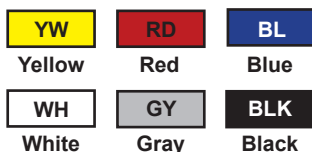**Bar Graph Display
091-200-IND**

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

**Status Center Display
For LPC 40: 091-194-IND**

Color Options

YW	RD	BL
Yellow	Red	Blue

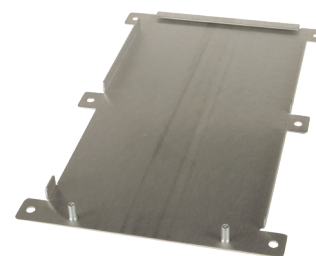| WH	GY	BLK
White	Gray	Black

**Super Auto Eject
Deluxe Covers Available
for this product
see page 40**

Optional Accessory

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

For slide-in installation and removal of the LPC 40 or LPC 20 in hard to access areas 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	6.0	13.25"	6.80"	3.30"	7
091-200-12-194	LPC 40, w/ Status Center	12	40	120	6.0	13.25"	6.80"	3.30"	7
091-200-12-194-WT-XX	LPC 40, w/ Watertight Display	12	40	120	6.0	13.25"	6.80"	3.30"	7
091-200-EZM	EZ Slide Mount Plate for LPC 40	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									

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

LPC 20

LPC 80

Features

- 20A and 80A for charging a single battery bank
- Clean output poses no interference with radios and other mobile electronics
- Includes a 15A auxiliary output circuit with power source selector switch for operating accessory loads i.e., air compressor pumps, hand lights or handheld radios
- Front panel connections for remote display and auxiliary loads
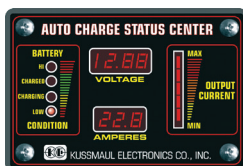- Includes a heavy duty aluminum case designed for emergency vehicle use

LPC 80
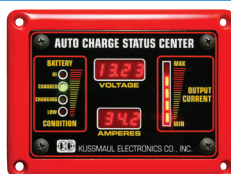
Remote Display Options

**Bar Graph Display
091-200-IND**

**Super Auto Eject
Deluxe Covers Available
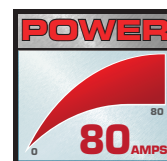for this product
see page 40**

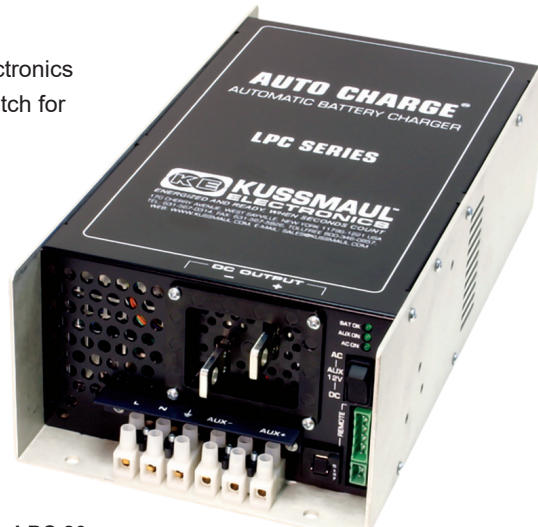**Status Center Display
LPC 20: 091-194B-IND
LPC 80: 091-194C-IND**

**Status Center Display
in Watertight Case
LPC 20: 091-194B-IND
LPC-80: 091-194C-IND-WT-XX**

Color Options see page 6

LPC 20

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
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 for LPC 20 and LPC 40 (see page 6)	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									
24 VDC version available, see Page 22 for details									

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Battery Chargers

Charge Single Battery Bank
Auxiliary Output for Electronics
Low Profile Design

EV 20   EV 40

Features

- 20 and 40A models available for charging a single battery bank
- Low profile design saves valuable space in compartments and/or under the seat
- Clean output poses no interference with radios and other mobile electronics
- A 15A auxiliary output circuit with a power source selector switch for operating accessory loads i.e., air compressor pumps, handheld lights or handheld radios
- Heavy duty terminal block for secure connections
- Durable powder coat finish
- Available as a kit with a remote battery meter
- Includes a heavy duty aluminum case designed for emergency vehicle use
- An optional mounting plate features slide-in and lock design for easy installation/removal under seats and other hard to access locations
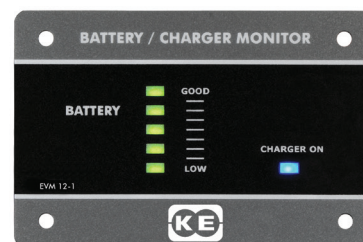
EV-20 Features

- 20A rating with a 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 to avoid overcharging
- Includes a battery type selector switch to program use with Gel Cell/Flooded Lead Acid/AGM batteries
- Operates on 90-250V input, auto range

Optional Accessories

Remote Bar Graph Display: 023-5353-1

- Charger "On" LED
- Bar graph battery condition
- Operates when charger is not powered
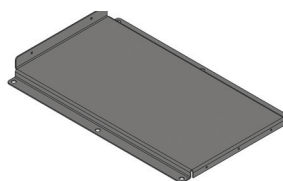
Slide-in Mounting Plate Assembly: 444-5279-0

Easy installation under seats and hard to access locations
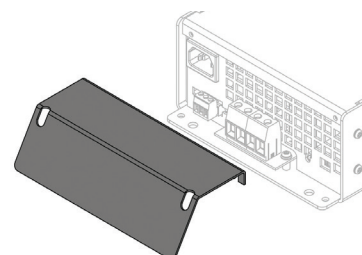
Kick Plate: 444-5280-0

Protects front panel connections

Part Number	Description	Electrical Data				Dimensions			Wt.
		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

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

Features

- 12 and 20A models available for charging a single battery bank
- Automatic operation regulates the output to a single battery bank
- Front panel amp meter indicates the output current (Optional vehicle side mount indicator available)
- Includes a heavy duty aluminum case with a protective front panel and wire strain relief designed for emergency vehicle use
- Auto Charge 12 is UL recognized
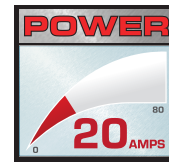
POWER **12** AMPS 0 80

12

POWER **20** AMPS 0 80

12 HO

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 is
UL Recognized:
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			Wt.
		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

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

Features

- 15A battery charger with a 3A battery saver
- Microprocessor controlled, completely automatic operation regulates the output to a single battery bank
- Precision voltage controller senses the battery voltage, eliminating the need for sense wires
- Programmable Parasitic Load Compensation allows for the user to input the total accessory load on the vehicle (in amps). 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 selection switch to select Gel Cell, Lead-Acid, 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 18A to charge the battery
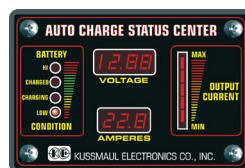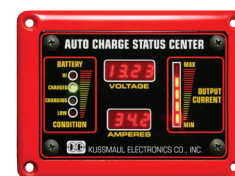- Patent pending

POWER
18 AMPS

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

Super Auto Eject Deluxe Covers Available for this product see page 40
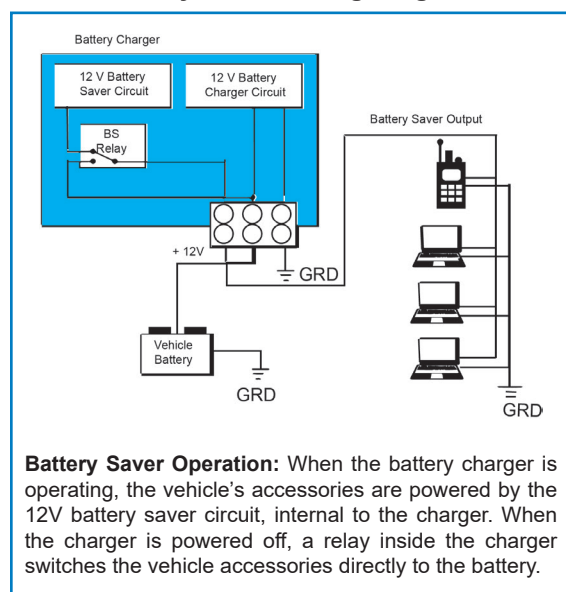

Status Center Display 091-194B-IND

Status Center Display in Watertight Case 091-194B-IND-WT-XX Color Options see page 6

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

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Charge Single Battery Bank at 20 Amps
Power Auxiliary Loads with 20 Amp Battery Saver
Front Panel Amp Meters
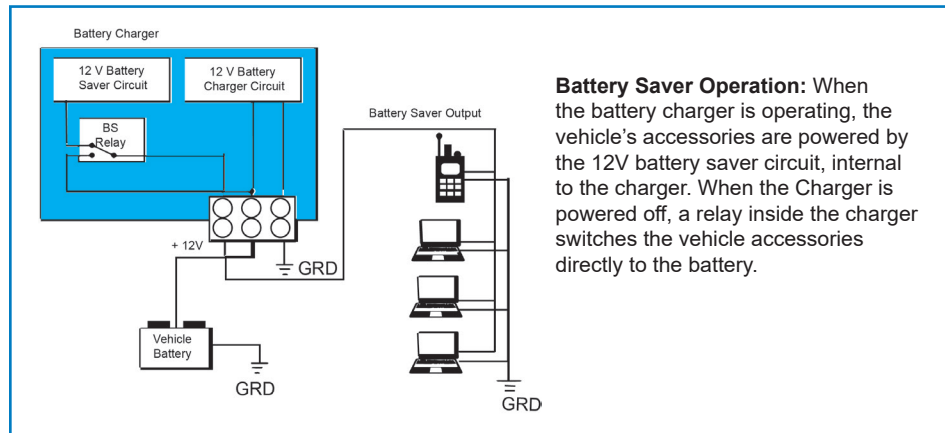
POWER
40 AMPS
0 — 80

Features

- 20A battery charger with a 20A battery saver
- Automatic operation regulates output to a single battery bank
- Separate 20A ATC fuse protected Battery Saver output eliminates any drain on the vehicle battery when in the station
  - Automatically disconnects auxiliary vehicle loads from battery when the 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
- Includes a heavy duty aluminum case designed for emergency vehicle use

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.

Part Number	Description	Electrical Data				Dimensions			Wt.
		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

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Next Generation Single Battery Bank at 40 Amps Power with Parasitic Load Compensation

Features

- NEW Parasitic Load Compensation (PLC) 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
- Patented PLC Technology
- NEW Low Profile-reduced height and lighter in weight
- Configurable for 3-Step or Float Charging
- Choice of Built-in Display options:
  - Bar Graph or Digital
- Choice of Remote Displays:
  - Single Bar Graph
  - Auto Charge Status Center
  - Auto Charge Status Center in Watertight Case
- Optional E-Z Slide Mounting Plate for slide-in installation and removal of the Auto Charge 1200 charger located in hard to access areas
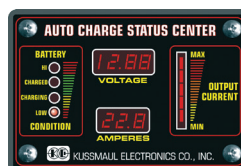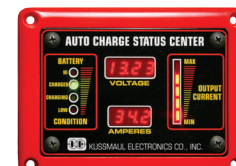- Accommodates Lead - Acid, Gelled Electrolyte, AGM and Odyssey® battery types

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.

Remote Display Options

Bar Graph Display
091-199-001

Super Auto Eject
Deluxe Covers Available
**for this product**
see page 40

Status Center Display
091-194-IND

Status Center Display in Watertight Case
091-194-IND-WT-XX
Color Options see page 6
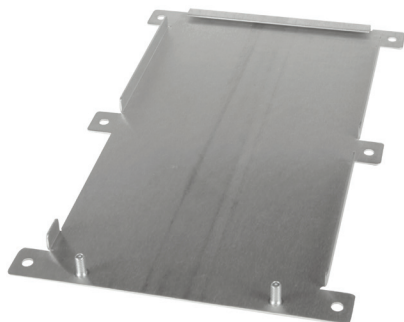
Part Number	Description	Electrical Data				Dimensions			Wgt
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-187-12	Auto Charge 1200	12	40	120	6.0	13.25"	6.80"	3.30"	7
091-187-12-194	Auto Charge 1200 with Status Center	12	40	120	6.0	13.25"	6.80"	3.30"	7
091-200-EZM	EZ Slide Mount Plate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All units also available in 240 VAC Input, contact the sales department for part number									

KUSSMAUL ELECTRONICS
ENERGIZED AND READY, WHEN SECONDS COUNT

Next Generation Low Profile Charger with PLC at 40 Amps
Power Onboard Electronics Remote Display Included

POWER 40 AMPS

NEW
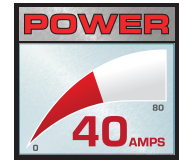
Features

- NEW Patented Parasitic Load Compensation (PLC), adjustable for 5-35 amperes
- NEW Low Profile-reduced height and lower in weight
- Allows user input of total accessory load amps on vehicle
- Output voltage regulated
- Configurable for 3-Step or Float Charging
- Selectable for 1,5, or 10 hour Safety Timer while in 3-Step mode
- Choice of Remote Display:
  - Single Bar Graph
  - Auto Charge Status Center
  - Auto Charge Status Center in Watertight Case
  - Super Auto Eject Deluxe Cover- #091-55-234-XXX Bar Graph and #091-55-194-XXX Digital Display
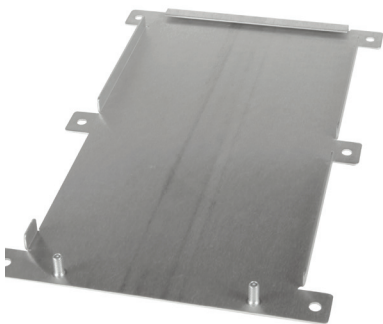- Accommodates Lead-Acid, Gelled Electrolyte, AGM and Odyssey® battery types

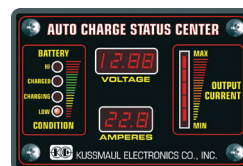### Optional Accessory

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
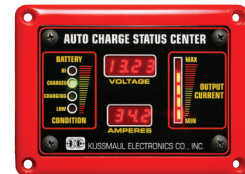
Remote Display Options

Bar Graph Display
091-199-001

Super Auto Eject Deluxe Covers Available for this product see page 40

Status Center Display
091-194-IND

Status Center Display in Watertight Case
091-194-IND-WT-XX Color Options see page 6

Part Number	Description	Electrical Data				Dimensions			Wt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-187-12-REMOTE	1200 Remote w/ Bar Graph	12	40	120	6	13.25"	6.80"	3.30"	7
091-187-12-R-194	1200 Remote w/ Status Center	12	40	120	6	13.25"	6.80"	3.30"	7
091-187-12-R-194-WT-XX	1200 Remote w/ Watertight S.C.	12	40	120	6	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									

KUSSMAUL ELECTRONICS
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800-346-0857 • email: sales@kussmaul.com
www.kussmaul.com

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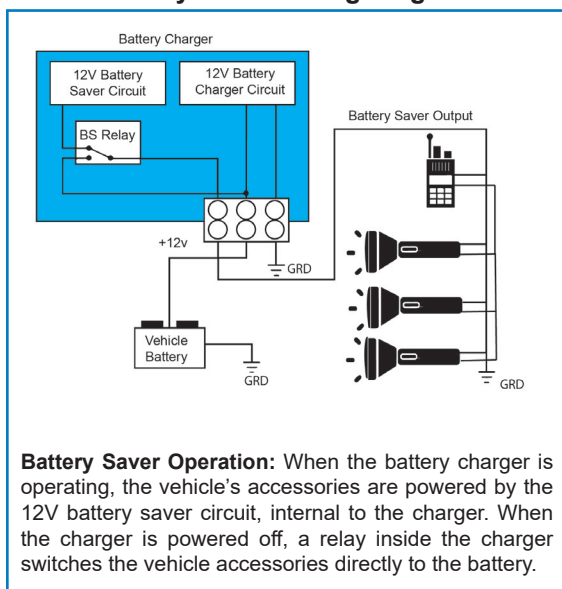## Remote Display Included

Features

- 35A battery charger with a 10A battery saver
- Automatic operation regulates the output to a single battery bank
- A patented built-in sense circuit checks the battery voltage 120 times per second to compensate for a voltage drop in the charging wires providing a quick re-charge and avoiding overcharging
- A separate 10A Battery Saver output eliminates any drain on the vehicle battery when in the station
  - Automatically disconnects any auxiliary vehicle loads from the battery when the charger is energized
  - Ideal for charging handheld 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 and Battery Saver circuit overload
- A Remote Bar Graph Display is included
- Includes a heavy duty aluminum case with a protective front panel plate and wire strain relief designed for emergency vehicle use

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

Super Auto Eject Deluxe Covers Available for this product see page 40

Part Number	Description	Electrical Data				Dimensions			Wt.
		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

KUSSMAUL ELECTRONICS
ENERGIZED AND READY, WHEN SECONDS COUNT

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

POWER 60 AMPS
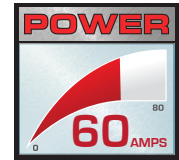
Features

- 40A battery charger with a 20A battery saver
- Automatic operation regulates the output to a single battery bank
- Separate 20A ATC fuse protected Battery Saver output eliminates any drain on the vehicles battery when in the station
  - Clean output poses no interference with radios and other mobile devices
- Gel Cell, Lead-Acid, and AMG switch selects the optimum charge/float voltages based on the battery type
- 1-hour "boost" voltage for rapid battery recovery
- Automatic current limit
- Reverse polarity protected
- AC input circuit breaker protection

BATTERY CHARGERS
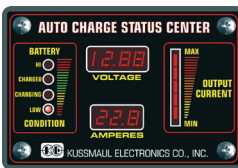
Remote Display Options

Bar Graph Display
091-200-001

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

Super Auto Eject Deluxe Covers Available for this product
see page 40
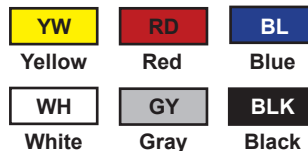
Part Number	Description	Electrical Data				Dimensions			Wt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-216-40/20	Auto Charge 40/20 w/ Bar Graph Display	12	40 / 20	120	8.5	13.25"	7.13"	5.25"	13
091-216-40/20-194	Auto Charge 40/20 w/ Status Center	12	40 / 20	120	8.5	13.25"	7.13"	5.25"	13
091-216-40/20-194-WT-XX	Auto Charge 40/20 w/ Watertight Display	12	40 / 20	120	8.5	13.25"	7.13"	5.25"	13

Auto Charge 1

For Charging Small Batteries

POWER 1 AMP

Auto Charge 1

Features

- 1A charge rate is ideal for small 12V batteries (5-20 Amp/Hour) and avoids overcharging
- Automatically charges the battery
- Low ripple output won't cause interference with the electronics
- Current limited so it cannot be overloaded
- Compact and sturdy molded case with mounting flanges for vehicle installation
- Fan-less operation

Maintenance Master

For Auxiliary Generators

POWER 7 AMPS
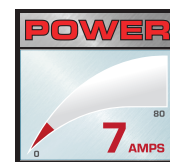
Maintenance Master

Features

- 5A, 12V charge rating (6 & 24V units also available)
- Designed specifically for maintaining generator start batteries
- Automatically shuts off when batteries are fully charged to avoid overcharging
- Ammeter indicates the charge rate
- Features a rugged aluminum case designed for industrial use
- Compact size and is wall mountable

Part Number	Description	Electrical Data				Dimensions			Wt.
		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

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

Features

- 10 and 20A models are available
- Automatically charges dual battery banks utilizing independent sense circuits that control voltage and current to each battery. Parasitic loads on one battery do not affect the second
- Full amperage output is available to either battery if the adjacent bank does not require charging, optimizing the use of available power when charging banks with differing parasitic load rates
- Front panel amp meter indicates the total output current
- Optional Remote Bar Graph display or LED indicator
- Includes a heavy duty aluminum case with a protective front panel plate and wire strain relief designed for emergency vehicle use
- Model 11, UL recognized

10 **11 HO**

Model Shown is UL Recognized: Auto Charge 11

Optional Configurations

AC Outlet in Front Panel:

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

Dual Voltage Input:

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

Remote Display Options

Dual Bar Graph Display
091-11-127

LED Display
091-11-102-12

BATTERY CHARGERS

Part Number	Description	Electrical Data				Dimensions			Wt.
		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

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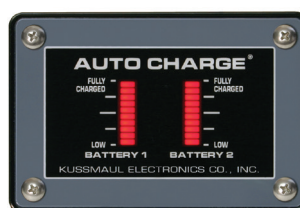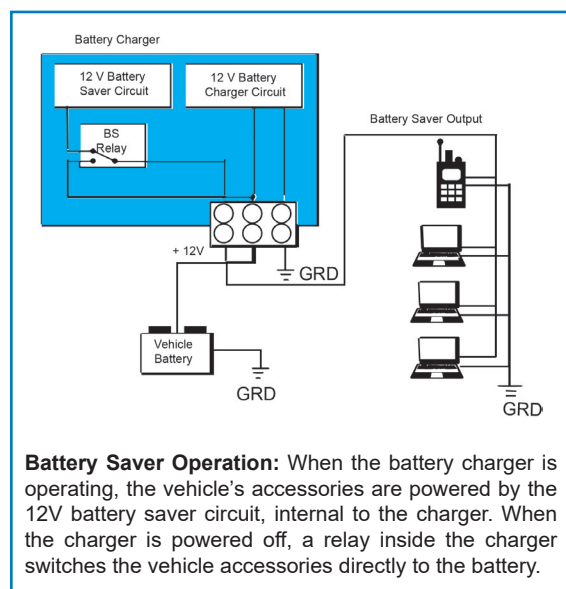## Remote Display Included

Features

- 15A charger with a 3A battery saver
- Automatically charges dual battery banks utilizing independent sense circuits that control the voltage and current to each battery. Parasitic loads on one battery do not affect the second
- Precision voltage controller senses the battery voltage which eliminates the need for sense wires
- Full amperage output is available to either battery bank if the adjacent bank does not require charging, optimizing the use of available power when charging banks with differing parasitic load rates
- Programmable Parasitic Load Compensation allows for the user to input the total accessory load on the vehicle (in amps). This allows the charger to shift the absorption stage set point so the battery voltage drops to the float voltage when the desired current is reached
- Separate 3A Battery Saver output eliminates any drain from auxiliary loads on the vehicle battery when in the station
  - Automatically disconnects auxiliary vehicle loads from the battery when the charger is energized and powers them from the internal power supply
- Includes a heavy duty aluminum case designed for emergency vehicle use

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: 091-39-IND

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

Remote Display Option

NEW Super Auto Eject Deluxe Cover with Bar Graph Display and Dual LED Indicator available for this product. See page 40
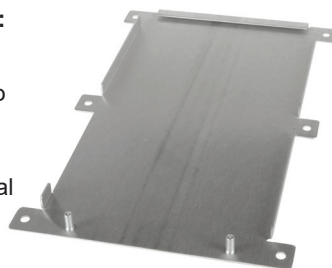
Part Number	Description	Electrical Data				Dimensions			Wt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-237-12	AC 2000 PLC, w/ Dual Bar Graph	12	15 / 3	120	3.5	9.35"	5.90"	4.725"	17

Next Generation Dual Output Charger at 45 Amps
Remote Display Included
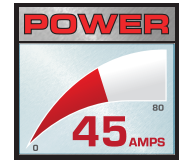
Features

- Next Generation 45A charger
- NEW - Low Profile-reduced height and lower in weight
- Designed for vehicles with dual battery system
- Output voltage regulated
- NEW - Accommodates Lead-Acid, Gelled Electrolyte, AGM and Odyssey® battery types
- Auxiliary 15 amp output circuit with AC/DC selector switch for operating accessory loads: air compressor pumps, handlights or handheld radios
- Front panel connections for remote display and auxiliary loads
- Includes a heavy duty aluminum case designed for emergency vehicle use
- Power "On" LED indicator
- System Status Indicator
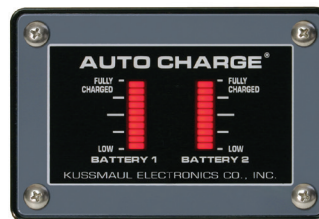
Remote Bar Graph Display Included: 091-39-IND

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

BATTERY CHARGERS

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


Remote Display Option

NEW Super Auto Eject Deluxe Cover with Bar Graph Display and Dual LED Indicator available for this product. See page 40

Part Number	Description	Electrical Data				Dimensions			Wt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
091-89-12	AC 4000, w/ Dual Bar Graph	12	45	120	6	13.25"	6.80"	3.30"	7
091-89-24	AC 4000, w/ Dual Bar Graph	24	20	120	3	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
Units also available in 240 VAC Input, contact the sales department for part number									

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BATTERY CHARGERS

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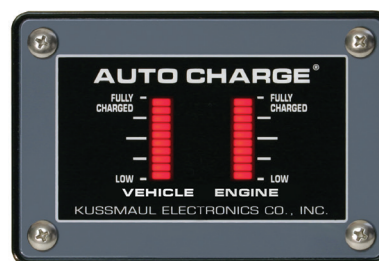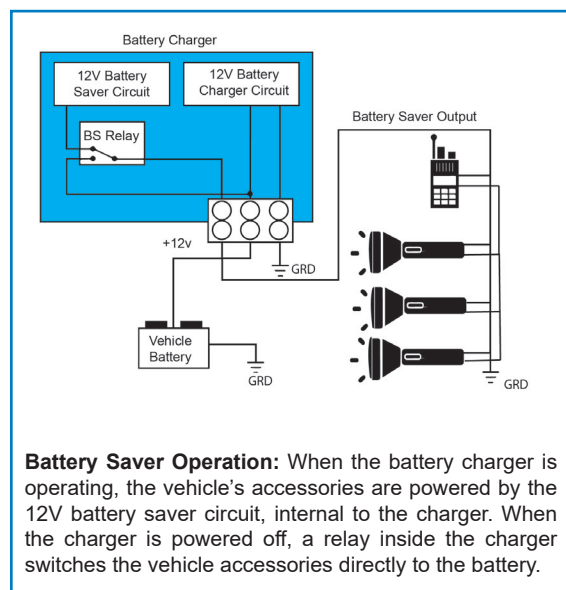## Remote Display Included

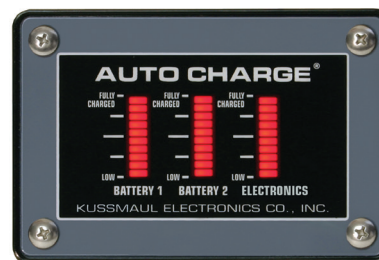**POWER**
33 AMPS
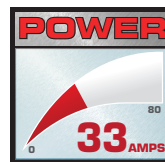
Features

- 28A battery charger with a 5A battery saver
- Designed for DDEC Vehicles
- Automatic operation regulates the output to multiple battery banks
- A patented built-in sense circuit checks the battery voltage 12 times per second to compensate for a voltage drop in charging wires providing a quick re-charge without overcharging
- Model D: two battery banks, Model D2: three battery banks
- Separate 5A Battery Saver output eliminates any drain from auxiliary loads on the vehicle battery when in the station
  - Automatically disconnects auxiliary vehicle loads from the battery when the charger is energized and powers them from the internal power supply
  - **Not recommended for powering highly sensitive electronic loads**
- Front panel LED displays AC power applied and Battery Saver circuit overload
- Includes a heavy duty aluminum case designed for emergency vehicle use

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			Wt.
		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

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

Features

- 20A for charging three battery banks
- Automatically charges three battery banks utilizing independent sense circuits that control the voltage and current to each battery. Parasitic loads on one battery do not affect the others
- Full amperage output is available to any battery if the adjacent banks do not require charging, optimizing the use of available power in charging banks with differing parasitic load rates
- Front panel amp meter indicates total output current
- Optional remote display
- Includes a heavy duty aluminum case with a protective front panel plate and wire strain relief designed for emergency vehicle use

Optional Configurations

AC Outlet in Front Panel:

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

Dual Voltage Input:

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

Remote Display Options

Bar Graph Display
091-118-022-12

LED Display
091-11-102-12

Part Number	Description	Electrical Data				Dimensions			Wt.
		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

BATTERY CHARGERS

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

POWER

45 AMPS

0 80

Features

- 45A charger for 24VDC vehicle configurations
- Light weight, small low profile size
- Clean output poses no interference with radios and other mobile devices
- 15A, 24VDC auxiliary output circuit with a power source selector switch for operating accessory loads i.e., air compressor pumps, handheld lights or handheld radios
- Front panel connections for a remote display and auxiliary loads
- Includes a heavy duty aluminum case designed for emergency vehicle use
- Remote battery sensing output to compensate for longer charging cables

Remote Display Options

**Bar Graph Display
091-200-IND**

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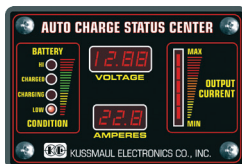
**Status Center Display
091-194C-24-IND**

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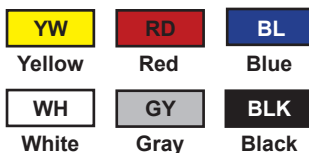
YW	RD	BL
Yellow	**Red**	**Blue**
WH	GY	BLK
White	**Gray**	**Black**

**Super Auto Eject
Deluxe Covers Available
for this product
see page 40**

| 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	24	45	120	13	13.75"	7.00"	4.09"	10
091-206-24-194C	LPC 45, w/ Status Center	24	45	120	13	13.75"	7.00"	4.09"	10
091-206-24-194C-WT-XX	LPC 45, w/ Watertight Display	24	45	120	13	13.75"	7.00"	4.09"	10
12 VDC version available, see Page 7 for details									

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

12A, Single or Dual Bank Output

40A, Single or Dual Bank
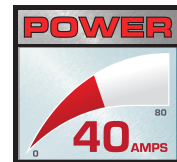
Euro Charger II
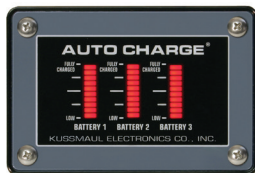

Euro Charger I

BATTERY CHARGERS

Features

- 12 and 40A models available
- Wide variety of input/output options to meet various international applications
- Automatically charges battery banks utilizing independent sense circuits that control the voltage and current to each battery. Parasitic loads on one battery do not affect the others
- Automatically charges and supports parasitic DC loads: data terminals, radios, hand lights, etc. assuring battery is ready for vehicle start
- Full amperage output is available to any battery if the adjacent banks do not require charging
- Front panel amp meter indicates the total output
- Optional LED or Bar Graph Remote Displays available
- 120/240V operation
- Meets CE requirements
- Includes a heavy duty aluminum case with a protective front panel plate and wire strain relief designed for emergency vehicle use

Remote Display Options

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

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

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

Part Number	Description	Electrical Data				Dimensions			Wt.
		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

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Euro Charger with Triple Battery Banks

POWER
18 AMPS
0 80
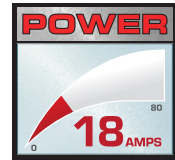
Euro Charger III

Features

- 9 and 18A models available
- Wide variety of input/output options to meet various international applications
- Automatically charges battery banks utilizing independent sense circuits that control the voltage and current to each battery. Parasitic loads on one battery do not affect the others
- Automatically charges and supports parasitic DC loads: data terminals, radios, hand lights, etc. assuring battery is ready for vehicle start
- Full amperage output is available to any battery if the adjacent banks do not require charging
- Front panel amp meter indicates the total output
- Optional LED or Bar Graph Remote Displays available
- 120/240V operation
- Meets CE requirements
- Includes a heavy duty aluminum case with a protective front panel plate and wire strain relief designed for emergency vehicle use

18A, Triple Battery Bank

Remote Display Options

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

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

Part Number	Description	Electrical Data				Dimensions			Wt.
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H	
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

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Automatically Power Onboard Computers and MDT's
When AC Line is Applied to Truck it Preserves Vehicle Battery.

Battery Saver Low Ripple, HO

Battery Saver LR 40, VHO

Features

- 20A and 40A, 12V battery saver
- Relay removes auxiliary loads from the vehicle battery and connects to the battery saver preventing the battery from discharging when it's in the station
- Clean, low ripple output causes no interference with sensitive electronics
- Fast acting relay ensures "glitch" free power transfer
- Current limiting prevents an overload
- Factory set to 13.2V
- Front panel "Power On" indicator
- Designed for rigors of emergency vehicle use; heavy duty case and components
- USB Model Only:
  - Front panel USB interface is used for recharging electronic devices i.e., iPhone
  - 5.0V, 1A USB Output

Battery Saver Wiring Diagram
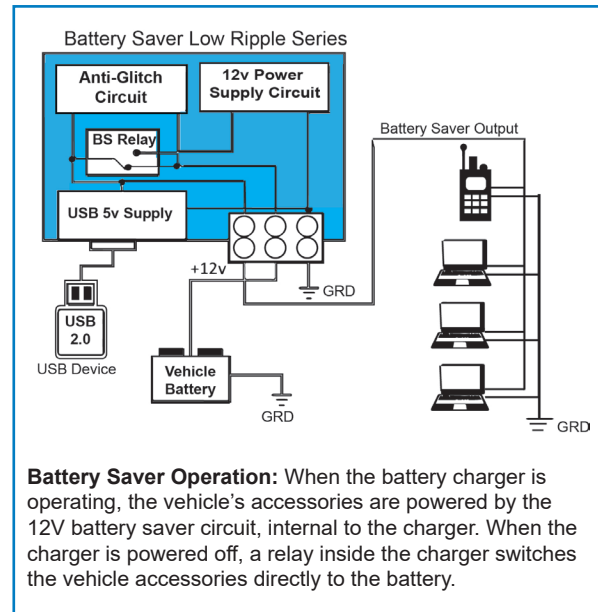
Battery Saver Low Ripple Series

Anti-Glitch Circuit | 12v Power Supply Circuit

BS Relay

USB 5v Supply

Battery Saver Output

+12v

GRD

USB 2.0

USB Device

Vehicle Battery

GRD

GRD

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.

Part Number	Description	Electrical Data				Dimensions			Wt.
		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
091-256-12	Battery Saver Low Ripple, VHO	12	40	120	4.5	2.50"	5.50"	13.00"	5

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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
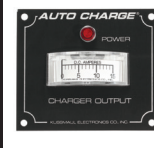Center Digital Display
Voltage & PSI
Page 28
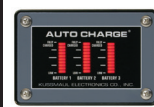
Remote Bar
Graph Displays
Single, Dual & Triple
Page 29

Super Auto Eject
Deluxe Cover
Page 30

DC Volts &
DC Amps Displays
Page 30

DC Ammeter
IN-3-XX
Page 30

LED Display
IN-4
Page 30

LED
Display
Page 30

Vertical Display
Mount
Page 30

Display Panel
Rear Seal
Page 30

DC/AC Clamp
Meter
Page 31

Digital Auto
Level
Page 31

TG-3:
Temperature
Display
Page 31

DCE
DC Energy Display
Page 31

DCV
Voltmeter Display
Page 31

Engine Monitor

Digital read out of vital engine data: DC Voltage, Oil Pressure, Temperature, and Tachometer

Audio and visual alarm for out of limit conditions operates from the J1939 can bus input

Features

- Programmable alarm set points for Oil, Temp, Voltage, and RPM
- Internal audio alarm with a remote alarm output signal
- Input signal wire assembly with a waterproof Deutsch connector
- 4"x4" low profile display
- Waterproof meter face

* New Feature - User Selectable Baud Rate (50, 125, 250, 500 or 1000k bits)

Part Number	Description	Electrical Data		Dimensions			Wt.
		Input Volts	Input Signal	L	W	H	
023-4400-0	VOTT	9-33V DC	J 1939	4.3"	4.3"	3.5"	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

- 4 functions, all display simultaneously on one screen: Volts, (2) Amps, Frequency
- Hour meter displays when the generator is off
- Programmable alarms: HIGH/LOW for Volts/Frequency and HIGH alarm for Amps (2 lines). Alarm modes: Red warning color with a built in 85db audible alarm, with an output signal for an external alarm relay
- User programmable service hour interval settings and notification
- Waterproof meter face

Part Number	Description	Electrical Data			Dimensions			Wt.
		Operating Voltage	Sense Voltage	Max. Power	L	W	H	
023-4500-0	VAAFH	9-33 VDC	120/240 VAC	36 kW	4.3"	4.3"	3.5	2

Generator AC/DC System Monitor

6 functions, all display simultaneously on one screen: Volts, Amps, Frequency, DC Volts, and DC Amps

Audio and visual alarm for out of limit conditions

Features

- Programmable alarms: HIGH/LOW for AC Volts and Frequency and HIGH alarm for Amps (2 lines). HIGH/LOW for DC Volts and HIGH alarm for DC Amps
- Alarm Modes: Red warning color visual indication, plus built in 85db audible, with output signal for external alarm relay.
- User programmable service hour interval settings and notification
- Waterproof meter face

Part Number	Description	Electrical Data		Dimensions			Wt.
		Input Volts	Input Signal	L	W	H	
091-247	VAAFH AC/DC	9-33V DC	0.100A	4.3"	4.3"	3.5	2

INDICATORS / METERS

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Status Center Digital Displays With Bar Graph
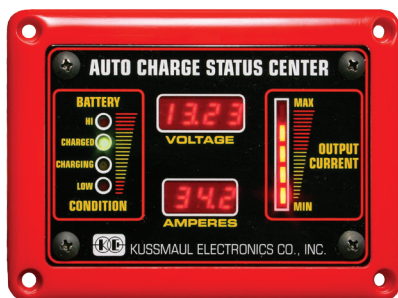
091-194X-IND-WT-XX
Watertight Heavy Duty Housing, Size: 5.45" x 3.95"
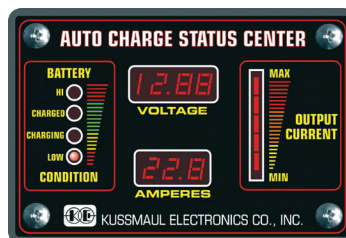
091-194X-IND
Standard Housing, Size: 3.2" x 4.7"

These displays provide digital Voltage and Ampere readouts, a 5 segment bar graph indicating the output current, and 4 LED's showing the battery condition. They are available in two different housings: standard and watertight. The watertight housing is available in multiple colors. This display is compatible with the 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 Yellow | WH White | RD Red | GY Gray | BL Blue | BLK 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"
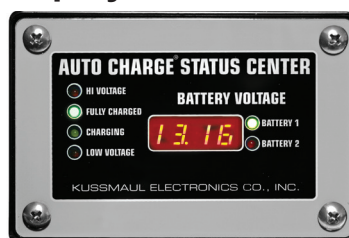
091-189-2-12 (1 decimal place accuracy)
091-189-2-12-3.5D (2 decimal place accuracy)
Dual Battery Display, Size: 3.2" x 4.7"

These universal displays are compatible with all vehicles with or without Kussmaul chargers. They display the voltage digitally and indicate the battery condition via LED's. The LED's flash when high or low voltage is sensed. These displays are available in 1 or 2 battery bank models, one or two decimal accuracy, and 12 or 24V systems.

Auto Pump Status Center Digital Displays
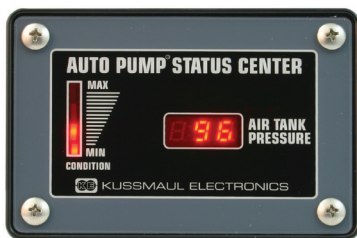
091-198-12-AP
PSI Only, Size: 3.2" x 4.7"
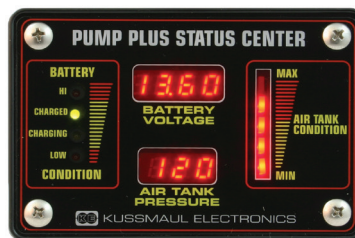
091-198-12-PP
Voltage & PSI, Size: 3.2" x 4.7"

These displays are an air pressure sensor with an indicator that displays in PSI. The "AP" display contains a numerical display for PSI and a bar graph. The "PP" display contains a numerical display, a bar graph 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.
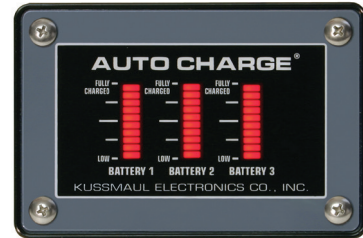
KUSSMAUL ELECTRONICS
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091-94-XX

This universal single battery bank Voltage display may be installed in any 12/24V system
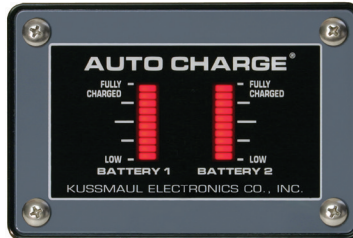
091-76-XX

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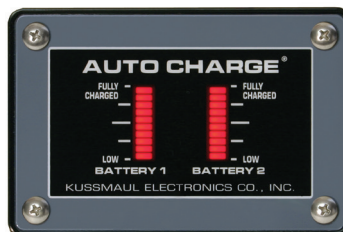(negative ground only)

091-118-022-XX

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

091-199-001

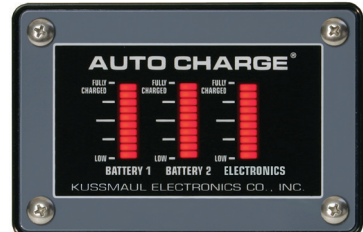This charger specific single battery condition bar graph display is normally supplied with these chargers:

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

091-39-IND

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

Auto Charge 2000 PLC
Auto Charge 4000
Pump Plus 2000 PLC

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
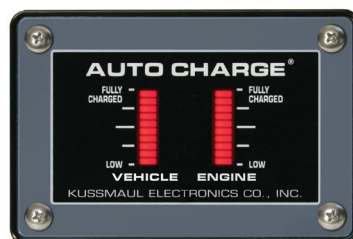
091-66-IND

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 PLC
Auto Charge 1200 Remote
Pump Plus 1000 PLC
Pump Plus 1200

INDICATORS / METERS

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Super Auto Eject Deluxe Covers with Battery Charger Indicators
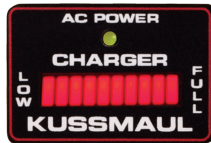
Bar Graph Display
091-55-234-XXX

Digital Display
091-55-194X-XXX

Digital Display for
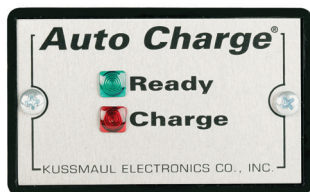**AP 2000, 3000**
091-55-269-XXX

Bar Graph Display
with Dual LED
**091-55-239-XXX**

NEW

Incorporates Auto Eject and Indicator in one product.

Extreme Duty Cover with Bar Graph or Digital Display compatible with select single Kussmaul battery chargers or Bar Graph Display with Dual LED Indicator for AC2000 and AC4000 battery chargers. For more information see page 40.

IN-4

This display is for the Pump Plus HO Battery Charger/Air Compressor system. It will not operate with other chargers.
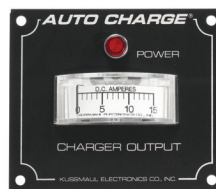
IN-3-XX

This indicator can be used with any charger. The neon pilot light indicates when power is applied to the vehicle. A DC ammeter is used to measure the battery chargers output current. Please specify ammeter current (15, 20 or 25) when ordering.
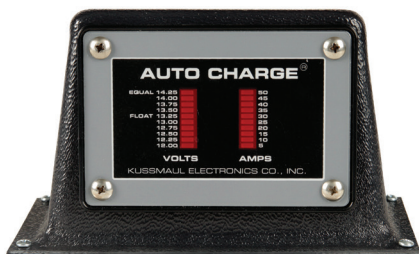
091-11-102-12

The 091-11-102-12 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.
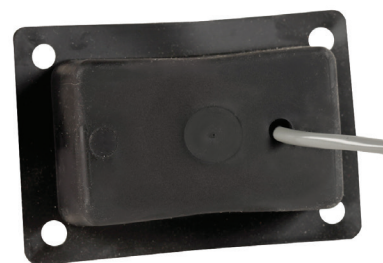
Display Panel Rear Seal
091-39-109

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

KUSSMAUL ELECTRONICS
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**DC/AC Clamp Meter
380941**

Features

- Inductive clamping jaw allows current measurement without disconnecting the 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
- Full-scale LCD Read out accurate within 1% +/-1 degree
- Five level back lighting "On" LED display
- Programmable HIGH/LOW temperature alarm- activates 85db warning alarm
- Programming via instrument front buttons
- Waterproof face fits a standard 2.125" instrument hole
- Includes (1) remote temperature sensor with 20' cable

**Auto Level
091-251**

**Optional:
Level Alarm- with High
Decibel Audible Alarm
091-260-S (12V)
091-260-S-24 (24V)**

**Auto Level and Level Alarm
Kits Available on Request
Please call Customer Service**

Features

- 2 Digit LED-Digital Angle Display
- 8 PCB surface mounted LEDs: Green and Yellow
- One wire zero calibration: can be re-calibrated
- Auto Orientation Detection: vertical or horizontal
- Waterproof: meets IP 64
- Lexan® overlay
- 3 Axis sensor
- Easy connection to 12V or 24V switched power
- Reverse polarity protected
- Two #8 mounting holes
- Optional: Audible Level Alarm
- Includes mounting gasket

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

Displays Volts, Amps, energy used, and remaining for 12/24V, up to 500A and 3,000A/h 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

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

Three battery bank digital read out for 12/24V battery systems. Includes a HIGH/LOW Voltage alarm built-in. Wires directly to the 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

INDICATORS / METERS

KUSSMAUL ELECTRONICS
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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 Auto
Eject
Page 34

Super Auto Eject
with Deluxe Cover
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
Page 39

Weatherproof
Covers
Page 40

Name Plates
Page 40

Wire & Wiring Kits
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Receptacles
Page 41

Connectors
Page 41

WPR-1
Page 41

32

KE KUSSMAUL ELECTRONICS
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Eject Plug from Shore Power on Engine Start

AC POWER 15 AMPS **AC POWER 20 AMPS** **DC POWER 15 AMPS**
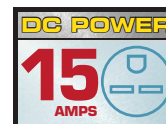
Features

- 15/20A AC, or 15A DC receptacle
- Upon sensing the engine starting, the plug ejects from receptacle and away from the vehicle which eliminates cord hazards
- After ejection a weatherproof cover snaps into position over the inlet
- 3.4" rear projection installs in the vehicle side walls with a limited depth clearance
- Available in 6 different colors
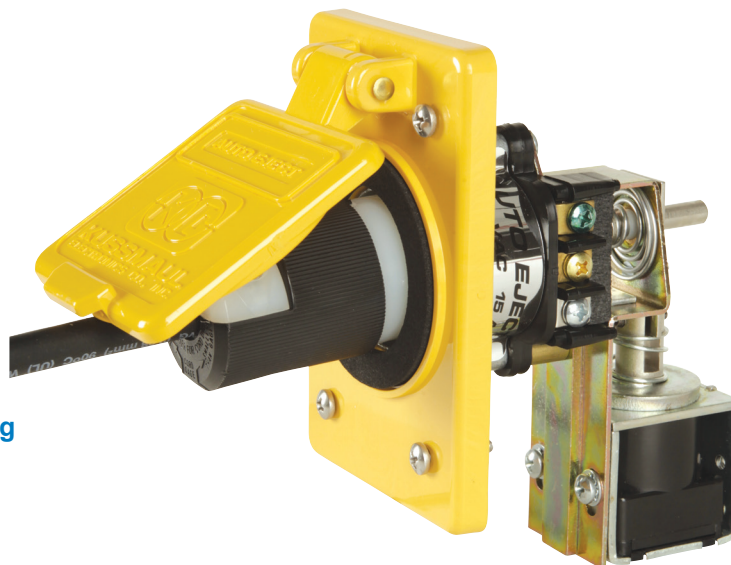
System includes: Auto-Eject, Cover and Plug

Optional Accessories

Dynamic Disconnect 091-18-098

Dynamic Disconnect:

Sequences energizing of the Auto Eject which eliminates terminal arcing when connecting and disconnecting to the receptacle

Rear Enclosure 091-18CP

Rear Enclosure:

For installations that expose the rear of the Auto Eject to outside elements

EZ Mounting Plate with Power Indicator 091-185-010

EZ Mounting Plate with Power Indicator:

Assemble and pre-wire the Auto Eject in this stainless steel plate, then mount to the vehicle wall. A green indicator light confirms the inlet is energized
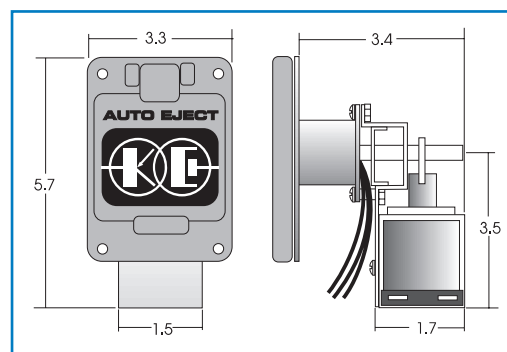
Wiring Accessories:

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

Weatherproof Cover Color Options

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

Auto Eject WP Dimensions

3.3 5.7 1.5 3.4 3.5 1.7

Part Number	Description	Electrical Data				Dimensions			Wt.
		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

CORD EJECT SYSTEMS

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www.kussmaul.com

Eject Plug from Shore Power On Engine Start

AC POWER 15 AMPS   **AC POWER 20 AMPS**   **DC POWER 15 AMPS**

Features

- 15/20A AC, or 15A DC receptacle
- The Super Auto Eject plug ejects from the receptacle and away from vehicle which eliminates cord hazards
- The Super Trailer Auto Eject plugs ejects from the receptacle upon engaging brake pedal prior to vehicle going into gear
- Sequences energizing of the Auto Eject which eliminates terminal arcing when connecting and disconnecting to the receptacle
- After ejection a weatherproof cover snaps into position over the inlet
- A weatherproof back enclosure with a watertight cable fittings protects the mechanism from road contamination
- Pre-wired with a 3' AC cord and an eject sense wire. Entry of the unit is on the side in the standard configuration, a back entry is also available on request.
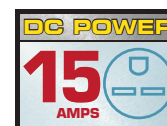
System includes: Auto-Eject, Cover, Plug, 3' AC power (pre-wired) and an Eject Sense Wire

Optional Accessories

EZ Mounting Plate with Power Indicator:

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

Other Accessories:

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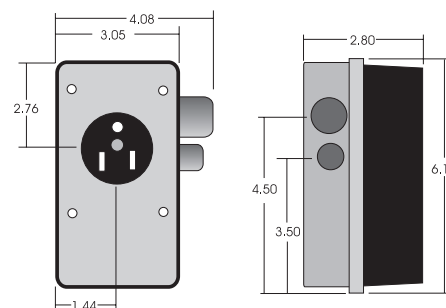
Optional Configuration

Back Wire:

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

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

Super Auto Eject Dimensions

4.08 / 3.05 / 2.76 / 1.44 / 2.80 / 4.50 / 3.50 / 6.17

Part Number	Description	Electrical Data				Dimensions			Wt.
		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
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	15	240	15	2.80"	4.08"	6/17"	4
091-55-15-DCT	Super Trailer 15 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

CORD EJECT SYSTEMS

Auto Eject and Charger Status In One Product

AC POWER 15 AMPS **AC POWER 20 AMPS** **DC POWER 15 AMPS**

Features

- 15/20A AC, or 15A DC receptacle
- Auto Eject- senses the engine starting, the plug ejects from the receptacle and away from vehicle which eliminates cord hazards
- Indicator displays the battery charger status
- Deluxe Lid opens 180 degrees
- Works with Kussmaul Battery Chargers CALL FOR MORE INFORMATION
- Sequences energizing of the Auto Eject which eliminates terminal arcing when connecting and disconnecting to the receptacle
- A sealed weatherproof rubber gasket protects the mechanism from road contamination

System includes: Auto-Eject, Deluxe Cover, Plug, 3' AC power (prewired) and an Eject Sense Wire

NEW

Bar Graph Display
has 10 RED LED bars

Digital Display
Has 3 digit numerical GREEN LED display for amps and voltage
- Works with many Kussmaul single Battery Chargers CALL FOR MORE INFORMATION

Bar Graph Display with Dual LED Indicator
- Compatible with Kussmaul Dual Battery Chargers, AC2000 and AC4000
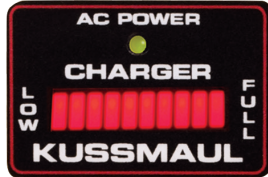
Bar Graph Display   **Digital Display**   **NEW Bar Graph Display with Dual LED**

See page 34 for Color Cover Options, Configurations, Dimensions and Optional Accessories

Part Number	Description	Electrical Data				Dimensions			Wt.	Color
		DC Volts	DC Amps	AC Volts	AC Amps	L	W	H		
61-11-2106	Bar Graph Display, (234)	12	N/A	120	15	2.80"	4.08"	6.17"	4	YW
63-11-2106					20					
63-11-5106	Digital Display (194B) for single battery chargers with output of 20A	12	N/A	120	20	2.80"	4.08"	6.17"	4	YW
61-11-3106	Digital Display (194), for single battery chargers with output of 40A	12	N/A	120	15	2.80"	4.08"	6.17"	4	YW
63-11-3106					20					
61-11-6106	Digital Display (194C), for single battery chargers with output of 80A	12	N/A	120	15	2.80"	4.08"	6.17"	4	YW
63-11-6106					20					
61-11-8106	Bar Graph Display (239), for AC 2000/4000 dual battery chargers	12	N/A	120	15	2.80"	4.08"	6.17"	4	YW
63-11-8106					20					
Contact Sales Department for additional kit configurations and colors										

CORD EJECT SYSTEMS

KUSSMAUL ELECTRONICS
ENERGIZED AND READY, WHEN SECONDS COUNT

800-346-0857 • email: sales@kussmaul.com
www.kussmaul.com

Eject 30 Amp Plug from Shore Power On Engine Start

AC POWER 30 AMPS 120V

AC POWER 30 AMPS 240 V

AC POWER 30 AMPS 240 V

Features

- 30A, heavy duty pin and sleeve contacts provide a reliable connection over years of insertion/eject cycles
- Three/four pin 120/240V configurations
- Smooth sculpted cover, no sharp edges
- Upon sensing the engine starting, the plug ejects from the receptacle and away from the vehicle which eliminates cord hazards
- Auto Eject energizing is delayed until the detector pin senses the plug is inserted, which eliminates terminal arcing
- After ejection, a weatherproof cover snaps into position over the inlet
- A weatherproof back enclosure with a watertight cable fittings protects the 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 the Auto Eject in this stainless steel plate, then mount to the vehicle wall. A green indicator light confirms the inlet is energized.

Model # 091-159-081-120, 120 Vac
Model # 091-159-081-240, 240 Vac

Super 30 Auto Eject Dimensions
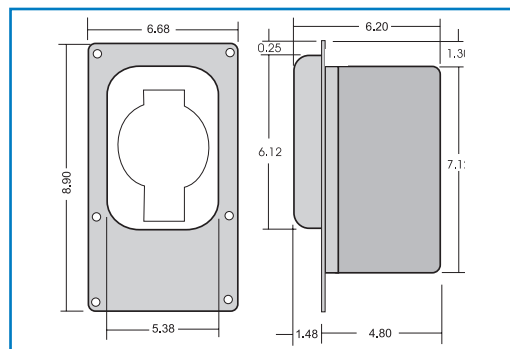
Optional Configuration

Back Wire:

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

| Part Number	Description	Electrical Data				Dimensions			Wt.
		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

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

AC POWER / PSI
30 AMPS 175 PSI
120V, 30A, 175PSI

AC POWER / PSI
30 AMPS 175 PSI
240V, 30A 175PSI

Features

- 30A, 120V, 175PSI, heavy duty pin and sleeve contacts provide a reliable connection over years of insertion/eject cycles
- Air connection is made through a brass fitting containing a shut-off valve
  - Shut-off valve opens when the plug is inserted to supply air pressure to the vehicle
  - Shut-off valve closes automatically when the plug is ejected, sealing off the air supply air
- Smooth sculpted cover with no sharp edges
- Upon sensing the engine starting, the plug ejects from receptacle and away from vehicle which eliminates cord hazards
- Air-Electric energizing is delayed until the detector pin senses the plug is inserted which eliminates terminal arcing
- A weatherproof back enclosure with watertight cable fittings protects the mechanism from road contamination
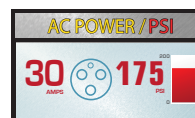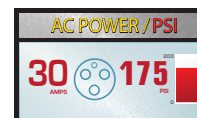
System includes:
Air/Electric Auto-Eject, Cover, Plug and 30' of Air Line

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	RD
Yellow	Red
WH	GY
White	Gray
BL	BLK
Blue	Black

### Optional Accessory

EZ Mounting Plate with Power Indicator:

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

Model # 091-159-081-120, 120 Vac
Model # 091-159-081-240, 240 Vac

120 VAC CONNECTED

Super 30 Auto Eject - Air / Electric Dimensions

6.68, 0.25, 6.20, 1.30, 8.90, 6.12, 7.1, 5.38, 1.48, 4.80
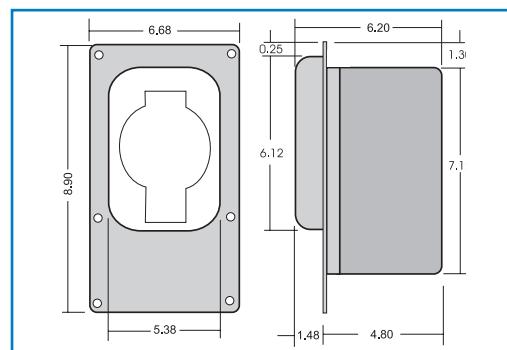
Part Number	Description	Electrical Data					Dimensions			Wt.
		DC Volts	DC Amps	AC Volts	AC Amps	Max PSI	L	W	H	
091-169-30-120	Super 30 Air-Electric Auto Eject	12 / 24	1.6	120	30	175	6.20"	6.68"	8.90"	8
091-169-30-250	Super 30 Air-Electric Auto Eject	12 / 24	1.6	240	30	175	6.20"	6.68"	8.90"	8
When ordering specify: Cover color code										

CORD EJECT SYSTEMS

KE KUSSMAUL ELECTRONICS
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www.kussmaul.com

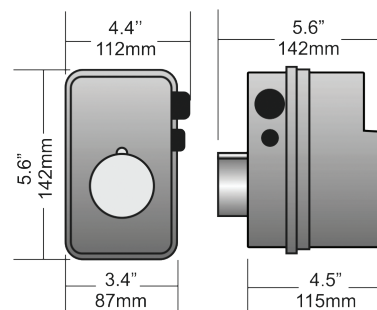## Eject European Configuration 16 Amp Plug from Shore Power On Engine Start

240V

Features

- 16A, heavy duty pin and sleeve contacts provide a reliable connection over years of insertion/eject cycles
- Three pin 240V configurations
- IEC 60309 standard European connector is provided
- 12/24V actuation voltages
- Smooth sculpted cover, no sharp edges
- Upon sensing the engine starting, the plug ejects from the receptacle and away from the vehicle which eliminates cord hazards
- Auto Eject energizing is delayed until the detector pin senses the plug is inserted which eliminates terminal arcing
- After ejection, a weatherproof cover snaps into position over the inlet
- A weatherproof back enclosure with a watertight cable fittings protects the mechanism from road contamination

System includes: Auto-Eject, Cover and Plug
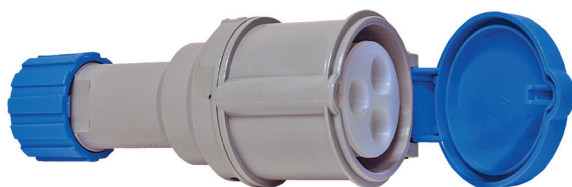
16A, 240V Plug
091-182-CON-3P-230

Weatherproof Cover Color Options

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

Optional Accessory

EZ Mounting Plate with Power Indicator:

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

Model # 091-182-027-120, 120 Vac
Model # 091-182-027-240, 240 Vac

Super 16 Auto Eject Dimensions

4.4" 112mm
5.6" 142mm
5.6" 142mm
3.4" 87mm
4.5" 115mm

Part Number	Description	Electrical Data Specs				Dimensions			Wt.
		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									

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KUSSMAUL ELECTRONICS
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CORD EJECT SYSTEMS

Eject Air Line From Vehicle Upon Engine Start

Features

- 140/175 PSI models are available
- Truck side mount pneumatic connector accepts standard air hose adapters to maintain pressure on the vehicles brake system when in the station
- Upon engine start the coupler disconnects and ejects the air line, preventing any hazardous and damaging drive-off situations
- A minimum of 20 PSI required for ejection

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 an indicator light confirming proper connection

Model #: 091-185-011

EZ Mounting Plate with Power Indicator

Weatherproof Cover Color Options

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

Auto Clean:

Paper roll filter element removes any contaminants from the air line.

Model #: 091-9G-2

Auto Clean

Auto Pump Status Center:

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

Model #: 091-198-12-AP

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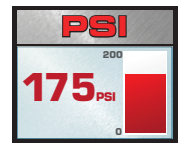
Part Number	Description	Electrical Data			Dimensions			Wt.
		DC Volts	DC Amps	Maximum PSI	L	W	H	
091-28	Air Eject	12	N/A	140	1.70"	2.85"	3.60"	2
091-28-24	Air Eject (24V)	24	N/A	140	1.70"	2.85"	3.60"	2
091-28HP	HP Air Eject	12	N/A	175	1.70"	2.85"	3.60"	2
091-28HP-24	HP Air Eject (24V)	24	N/A	175	1.70"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

CORD EJECT SYSTEMS

KUSSMAUL ELECTRONICS
ENERGIZED AND READY, WHEN SECONDS COUNT

Super Auto Eject Deluxe Covers
Use with Super 15 & 20 Auto Eject and Air Eject WP Adapter Kit

- Extreme duty cover with lid that opens 180º
- Incorporates Auto Eject and Indicator in one product
- Available in Bar Graph or Digital Display
- Works with Kussmaul chargers

091-55-234-XXX
Bar Graph

091-55-239-XXX
Bar Graph with
Dual Output

091-55-194X-XXX
091-55-269-XXX
Digital Display
Amperage/Voltage

Used With	Model	Type of Display
Super 15 & 20 Auto Eject Air Eject WP Adapter Kit	091-55-234-XXX*	Bar Graph Display
Super 15 & 20 Auto Eject Air Eject WP Adapter Kit	091-55-239-XXX*	Bar Graph Display with Dual Output
Super 15 & 20 Auto Eject Air Eject WP Adapter Kit	091-55-194X*-XXX*	Digital Display
Super 15 & 20 Auto Eject Air Eject WP Adapter Kit	091-55-269-XXX	Digital Display for AP 2000, 3000

**Amperage Options for Digital Display -194: 40A, 194A: 15A, 194B: 20A, 194C: 80A (indicate when ordering)

Standard Weatherproof Covers

Color Options

YW	RD	BL
Yellow	Red	Blue

WH	GY	BLK
White	Gray	Black

*Add suffix color code to
model # when ordering

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/AE

Use With	Model
Auto Eject WP	091-3XX*
Super Auto Eject 15, 20	091-55XX*
Super 16 Auto Eject	091-182XX*
Super 30 Auto Eject	091-159XX*

Nameplates
Self adhesive nameplates fit into recess on Auto Eject Weatherproof covers

AIR EJECT AIR LINE DISCONNECT

AIR COMPRESSOR 120 VOLT A.C. INPUT

BATTERY CHARGER 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

BLOCK HEATER 120 VOLT A.C. INPUT

BATTERY CHARGER BLOCK HEATER 120 VOLT A.C. INPUT

091-3XX

091-55XX

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*

Model	Nameplate	Type of Cover
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-Kit	All Nameplates	091-55XX*
091-55NP-01	Air Ejects	091-55XX*
091-55NP-02	Air Compressor	091-55XX*

Model	Nameplate	Type of Cover
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*

Wiring Kits

Includes:

- 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

Includes:

- Male receptacle
- Weatherproof cover (choice of color)
- Plug

Description		Model
15A AC		VW-10
15A AC		VW-12
20A DC		VW-11

Wiring Accessories

Includes:

- 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

Receptacles   Connectors

	15A, 120V AC **Model 5278C**		15A, 120V AC **Model 5-15P-H**
	20A, 120V AC **Model 5378C**		20A, 120V AC **Model 5-20P-H**
	15A, 12V DC **Model 5678C**		15A, 12V DC **Model 6-15P-H**

Wire

Includes:

- 30', 3 conductor wire

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

Retractile Cord

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

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, 15A, 12V, 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 120V, 20A 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

CORD EJECT SYSTEMS

AIR COMPRESSORS

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www.kussmaul.com

KUSSMAUL ELECTRONICS
ENERGIZED AND READY, WHEN SECONDS COUNT

Maintains Air Brake System Pressure
Compensates for System Leaks
100 PSI

Features

- 12V, 11A, 100 PSI Max Rating
- Vehicle mount compressor ensures the truck's air brake system is properly pressurized for immediate dispatch from the station
- Pressure switch regulated operation automatically senses low pressure in the air system and restores the proper pressure, preventing brake lock-up
- 15A circuit breaker installed in pressure switch
- 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
- No interference with an engine mounted air compressor
- Sealed ball bearings for long service life
- Compact size

Optional Accessories

Auto Clean:

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

Model #: 091-9G

Auto Drain:

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

Model #: 091-9-131

Vibration Dampening Mounting Plate:

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

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

Auto Pump Status Center:

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

Model #: 091-198-12-AP

Auto Pump Timer:

Cycles power to the compressor on a one hour "ON"/"OFF" interval, conserving batteries, allowing the pump to cool, and extending component life. Indicator light activates when Pump is in "OFF" mode.
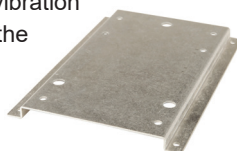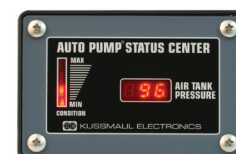
Model #: 091-150

Part Number	Description	Electrical Data				Dimensions			Wt.
		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

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www.kussmaul.com

AIR COMPRESSORS

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

Features

- 12V, 11A, 125 PSI Max Rating
- Vehicle mount compressor ensures the truck's air brake system is properly pressurized for immediate dispatch from the station
- Pressure switch regulated operation automatically senses low pressure in the air system and restores the proper pressure, preventing brake lock-up
- 15A circuit breaker installed in pressure switch
- 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
- No interference with an engine mounted air compressor
- Sealed ball bearings for long service life
- Compact size, vertical or horizontal model configurations
- Includes an Auto Drain: Automatically purges the water separator bowl every time the compressor cycles off via a 12V solenoid. It also eliminates the manual draining chore for maintenance personnel.

Optional Accessories

Auto Pump Timer:

Cycles power to the compressor on a one hour "ON" / "OFF" interval, conserving batteries, allowing the pump to cool and extending component life. Indicator light activates when Pump is in "OFF" mode.

Model #: 091-150

Vibration Dampening Mounting Plate:

Simplifies the installation and provides vibration dampening shock mounts pressed into the plate at the pumps mounting points.
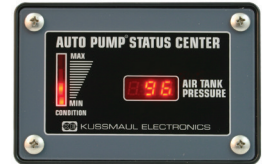
Model #: 091-9-12V-HP-H

Auto Pump Status Center:

This display is an air pressure sensor with an indicator that displays air pressure in PSI.
The display contains a numerical display for PSI and a bar graph. The air pressure sensor port is connected to an air supply to measure and display the PSI. The indicator is designed for exterior mounting so that the PSI condition may be easily viewed outside the vehicle.
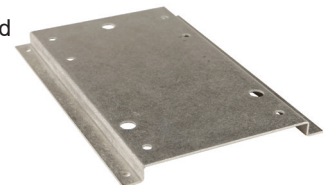
Model #: 091-198-12-AP

Part Number	Description	Electrical Data				Dimensions			Wt.
		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

- 120V, 4A, AC operation 100 PSI Max Rating
- Vehicle mount compressor ensures the truck's air brake system is properly pressurized for immediate dispatch from the station
- Pressure switch regulated operation automatically senses low pressure in the air system and restores the 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.
- No interference with an engine mounted air compressor
- Sealed ball bearings for long service life
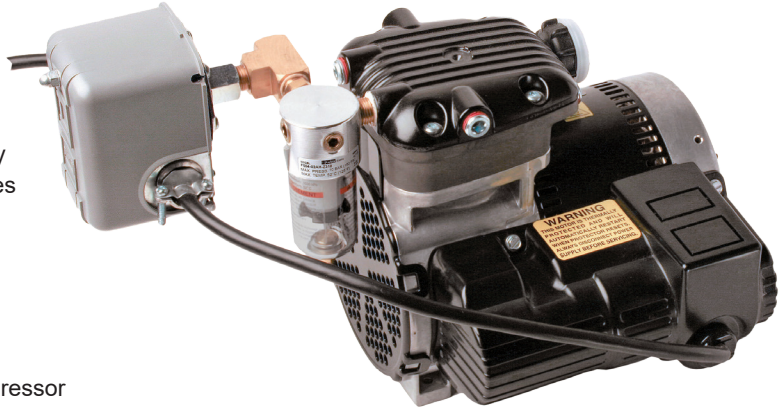
Optional Accessories

Auto Drain:

Automatically purges the water separator bowl every time the compressor cycles off via a 120 VAC solenoid. It also eliminates the manual draining chore for maintenance personnel. Available as a retrofit accessory or order pre-installed on an Auto Pump.
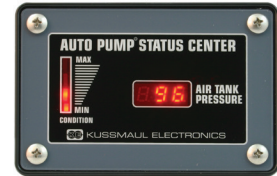
Model #: 091-9-089

Auto Pump Timer:

Cycles power to the compressor on a one hour "ON" / "OFF" interval, conserving batteries, allowing the pump to cool, 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 an indicator that displays air pressure in PSI. The display contains a numerical display for PSI and a bar graph.
The air pressure sensor port is connected to an air supply to measure and display the PSI. The indicator is designed for exterior mounting so that the PSI condition may be easily viewed outside the vehicle.

Model #: 091-198-12-AP

Vibration Dampening Mounting Plate:

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

Model #: 091-9H-1

Part Number	Description	Electrical Data				Dimensions			Wt.
		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

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

Optional Accessories

Auto Drain:

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

Model #: 091-9-090

Auto Pump Timer:

Cycles power to the compressor on a one hour "ON" / "OFF" interval, conserving batteries, allowing the pump to cool, 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 an indicator that displays air pressure in PSI. The display contains a numerical display for PSI and a bar graph. The air pressure sensor port is connected to an air supply to measure and display the PSI. The indicator is designed for exterior mounting so that the PSI condition may be easily viewed outside the vehicle.

Model #: 091-198-12-AP

Vibration Dampening Mounting Plate:

Simplifies the installation and provides vibration dampening shock mounts pressed into the plate at the pumps 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

AIR COMPRESSORS

Auto Pump Timer

Cycles power to the compressor on a one hour "ON"/"OFF" interval, conserving batteries, allowing the pump to cool, and extending component life. Indicator light activates when Pump is in "OFF" mode.

Vibration Dampening Mounting Plate

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

Auto Clean, Filter Moisture Separator & Manual Drain

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

Auto Pump Tester

The Auto Pump Tester is a 0.5 gallon tank with a pressure gauge, bleed valve, and an 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 the components required for the 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 any manual draining chores for maintenance personnel. The AUTO DRAIN is available as a retrofit component or pre-installed on the AUTO PUMP
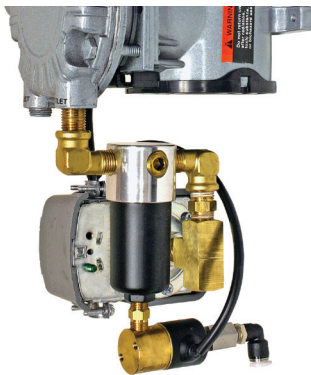
091-9-131
Fits the 091-9-12V
Auto Pump 12V

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			Wt.
		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

KITS AND PACKAGES

Pump Plus 1000 PLC
Page 49

Pump Plus 1200
Page 50

Pump Plus 2000 PLC
Page 51

Pump Plus HO
Page 52

Pump Plus
Auto Charge D
Page 53

Pump Plus,
Auto Eject Kits
Page 54

Charger,
Auto Eject Kits
Page 55

Charger,
Auto Pump AC Kits
Page 56

Charger,
Auto Pump AC,
Auto Eject Kits
Page 57

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

POWER 18 AMPS

PSI 100 PSI
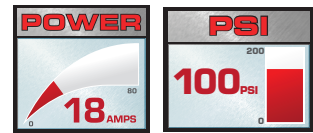
Features

- This system approach simplifies the complete installation Package includes: Pump Plus 1000 PLC with display and a 12V Auto Pump

- 12V, 100 PSI Max, air compressor Auto Pump, see page 43 for specs and page 47 for optional accessories

  - 15A battery charger with a 3A battery saver

    - Microprocessor controlled, completely automatic operation regulates the output to a single battery bank

    - Precision voltage controller senses the battery voltage, eliminating the need for sense wires

    - Programmable Parasitic Load Compensation allows for the user to input the total accessory load on the vehicle (in amps). 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 selection switch to select Gel Cell, Lead-Acid, 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 18A to charge the battery

    - Patent pending

    - Choice of Remote Display: Bar Graph, Status Center, or Status Center in a watertight case

    - Air Compressor power mode selector switch

      - DC Powered full time from the vehicle's battery

      - AC Powered only from the battery when the vehicle is plugged into the shore line

      - Automatically shuts off the compressor when disconnected from the shore line, taking the 12A load off the vehicle's battery

Part Number	Description
51-21-1100	Pump Plus 1000 PLC System with Bar Graph Display
51-21-3100	Pump Plus 1000 PLC System with Status Center
51-21-410X	Pump Plus 1000 PLC System with Watertight Status Center
091-215-12-PP	Pump Plus 1000 PLC Charger Only
51-21-3200	Pump Plus 1000 PLC Charger Only with Status Center
51-21-420X	Pump Plus 1000 PLC Charger Only with Watertight Status Center

Remote Display Options

Bar Graph Display 091-199-001

Super Auto Eject Deluxe Covers Available for this product see page 40

Status Center Display 091-194B-IND

Status Center Display in Watertight Case 091-194B-IND-WT-XX Color Options see page 6

KITS AND PACKAGES

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KE KUSSMAUL ELECTRONICS
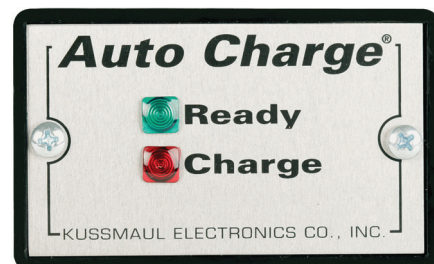*ENERGIZED AND READY, WHEN SECONDS COUNT*

Package Includes: Air Compressor, Charger and Remote Display System Components Maintain Air Brake Pressure, Batteries

Features

- This system approach simplifies the complete installation. Package includes: **Pump Plus 1200** and **12V Auto Pump**
  - 12V, 100 PSI Max, air compressor **Auto Pump**, see page 43 for specs and page 47 for optional accessories
  - 40A **Pump Plus 1200**, single battery output
    - Parasitic Load Compensation (PLC) 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
    - Patented PLC Technology
    - Low Profile - reduced height and lighter in weight
    - Output voltage regulated
    - Accommodates Lead-Acid, Gelled Electrolyte, AGM and Odyssey® battery types
    - Configurable for 3-Step or Float Charging
    - Selectable 1, 5 or 10 hour Safety Timer while in 3-Step mode
    - Adjustable Parasitic Load Compensation (5-35 amperes)
    - Power "ON" LED indicator
    - System Status indicator
    - Internal cooling fan

Remote Display Options
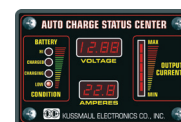
**Bar Graph Display
091-199-001**

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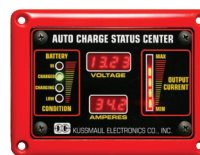
**Status Center Display
in Watertight Case
091-194-IND-WT-XX**

Color Options

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

Super Auto Eject Deluxe Cover with Bar Graph Display
available for this product
see page 40

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

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

Features

- This system approach simplifies the complete installation Package includes: **Pump Plus 2000 PLC** and **12V Auto Pump**
- 12V, 100 PSI Max, air compressor **Auto Pump**, see page 43 for specs and page 47 for optional accessories
  - 15A battery charger with a 3A battery saver
    - Microprocessor controlled, completely automatic operation regulates the output to a single battery bank
    - Precision voltage controller senses the battery voltage, eliminating the need for sense wires
    - Programmable Parasitic Load Compensation allows for the user to input the total accessory load on the vehicle (in amps). 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 selection switch to select Gel Cell, Lead-Acid, 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 18A to charge the battery
    - Patent pending
    - Remote Dual Bar Graph Display is included
    - Air Compressor power mode selector switch
      - DC Powered full time from the vehicle's battery
      - AC Powered only from the battery when the vehicle is plugged into the shore line
      - Automatically shuts off the compressor when disconnected from the shore line, taking the 12A load off the vehicle's battery

Remote Bar Graph Display Included: 091-39-IND

- Provides the state-of-charge status when in the station
- Indicates the charger is "ON" and operating

Remote Display Option

Super Auto Eject Deluxe Cover with Bar Graph Display and LED Indicator available for this product see page 40

Part Number	Description
53-21-1100	Pump Plus 2000 PLC System with Bar Graph Display
091-237-12-PP	Pump Plus 2000 PLC Charger Only

KITS AND PACKAGES

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Package Includes: Air Compressor, Charger with Remote Display System Components Maintain Air Brake Pressure, Batteries

Features

- This system approach simplifies the complete installation. Package includes: **Pump Plus HO** and **12V Auto Pump**
  - 12V, 100 PSI Max, air compressor **Auto Pump**, see page 43 for specs and page 47 for optional accessories
  - 11A charger **Model Pump Plus HO** for charging a dual battery bank
    - Automatic operation regulates the output to dual battery banks
    - A patented built-in sense circuit checks the battery voltage 120 times per second to compensate for a voltage drop in charging wires providing a quick re-charge without overcharging
    - LED Display optional
    - Air Compressor power mode selector switch
      - DC Powered full time from the vehicle's battery
      - AC Powered only from the battery when the vehicle is plugged into the shore line
      - Automatically shuts off the compressor when disconnected from the shore line, taking the 12A load off the vehicle's battery

Remote Display Option

**LED Display
IN-4**

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

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

Features

- This system approach simplifies the complete installation. Package includes: **Pump Plus Auto Charge D** and **12V Auto Pump**
  - 12V, 100 PSI Max, air compressor **Auto Pump**, see pg. 43 for specs and pg. 47 for optional accessories
  - 28A charger with a 5A battery saver **Pump Plus Auto Charge D** for charging a dual battery bank
  - Automatic operation regulates the output to dual battery banks
    - Designed for DDEC Vehicles
    - A patented built-in sense circuit checks the battery voltage 120 times per second to compensate for a voltage drop in charging wires providing a quick re-charge without overcharging
    - Separate Battery Saver output eliminates any drain on the vehicle's batteries when in the station:
      - Automatically disconnects the auxiliary vehicle loads from the battery when the charger is energized
      - Ideal for charging handheld lights and portable radios
      - 5A output with an 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 the vehicle's battery
      - AC Powered only from the battery when the vehicle is plugged into the shore line
      - Automatically shuts off the compressor when disconnected from the shore line, taking the 12A load off the vehicle's battery

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

Remote Bar Graph Display Included: 091-39-IND

- Provides the state-of-charge status when in the station
- Indicates the charger is "ON" and operating

KITS AND PACKAGES

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

Call for Kit Part #

With Super Auto
Eject Deluxe
Cover Option

Kit Configuration Options

1. Select Pump Plus Charger Model
2. Select Display
3. Select Display Bezel Color
4. Select Auto Pump, with or without Auto Drain

5. Select 15A or 20A Auto Eject
6. Specify Back Wire (BW) (Super Auto Eject Only)
7. Select Cover Option and Color for Auto Eject
8. Contact factory for your particular kit ordering information

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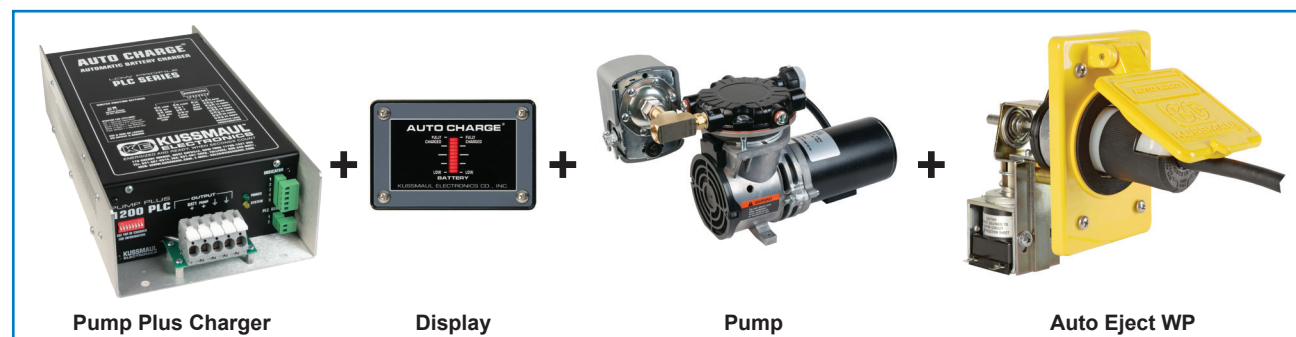
Part Number	Description	Charger	Pump	Display	Auto Eject	Color Cover
53-22-1106	Pump Plus 2000 Kit	Pump Plus 2000 PLC	Auto Pump 12V	Dual Bar Graph	Auto Eject 20WP	Yellow
51-22-1204	Pump Plus 1000 Kit	Pump Plus 1000 PLC	Auto Pump 12V	Single Bar Graph	Auto Eject 15WP	Red
52-22-1105	Pump Plus 1200 Kit	Pump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

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

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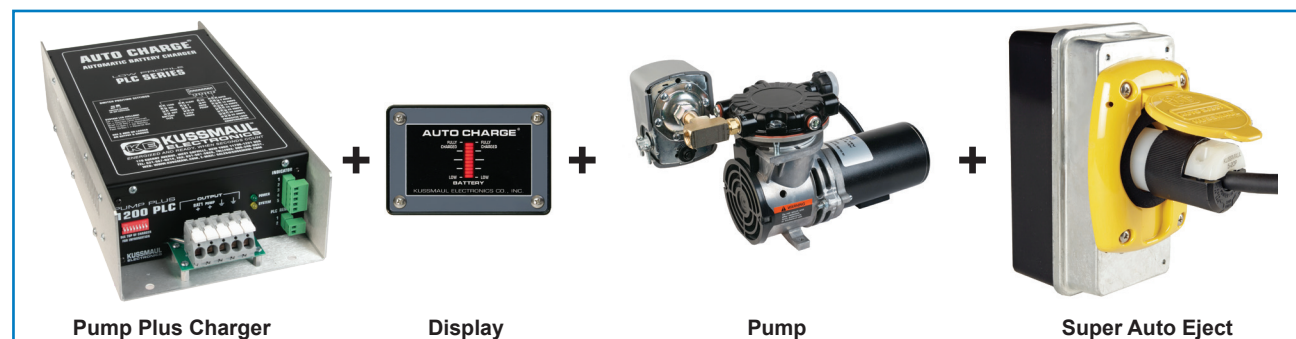
Part Number	Description	Charger	Pump	Display	Auto Eject	Color Cover
53-23-1106	Pump Plus 2000 Super Kit	Pump Plus 2000 PLC	Auto Pump 12V	Dual Bar Graph	Super Auto Eject 20	Yellow
51-23-1204	Pump Plus 1000 Super Kit	Pump Plus 1000 PLC	Auto Pump 12V	Single Bar Graph	Super Auto Eject 15	Red
52-23-1105	Pump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

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

KITS AND PACKAGES

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

Kit Configuration Options

1. Select Charger Model
2. Select Display
3. Select Display Bezel Color

4. Select 15A or 20A Auto Eject
5. Specify Back Wire (BW) (Super Auto Eject Only)
6. Select Cover Option and Color for Auto Eject

7. Contact factory for your particular kit ordering information

Call for Kit Part #

With Super Auto Eject Deluxe Cover Option

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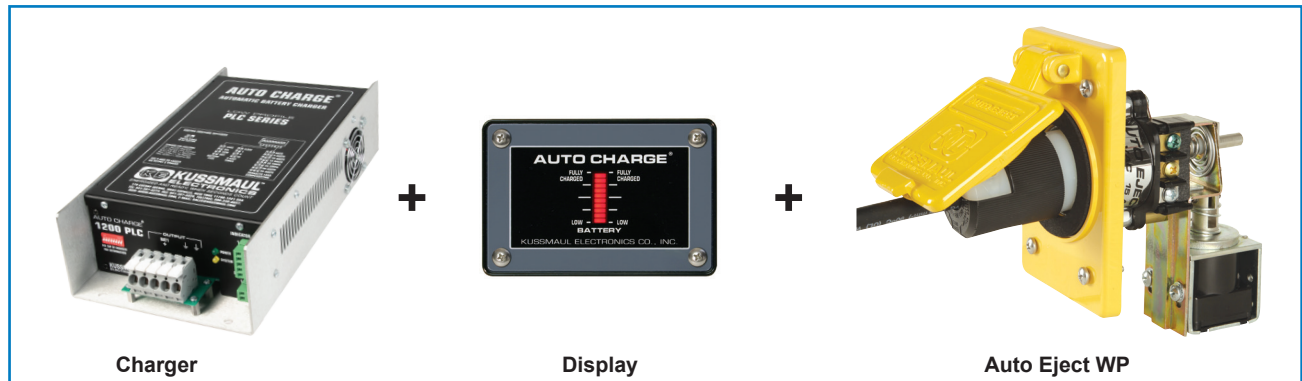
Part Number	Description	Charger	Display	Auto Eject	Color Cover
53-02-1106	Auto Charge 2000 Kit	Auto Charge 2000 PLC	Dual Bar Graph	Auto Eject 20WP	Yellow
51-02-1204	Auto Charge 1000 Kit	Auto Charge 1000 PLC	Single Bar Graph	Auto Eject 15WP	Red
52-02-4106	Auto Charge 1200 Remote Kit	Auto Charge 1200 PLC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

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

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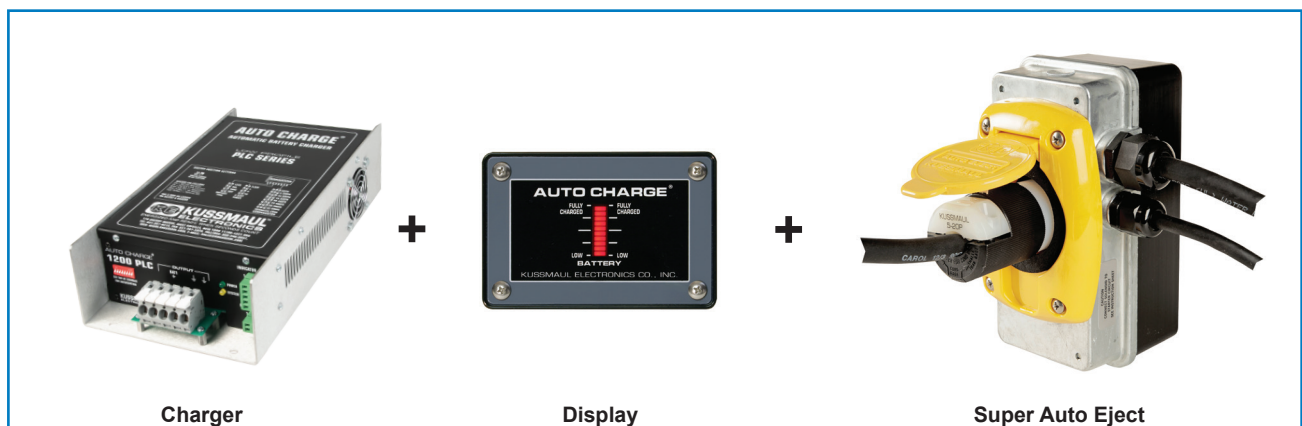
Part Number	Description	Charger	Display	Auto Eject	Color Cover
53-03-1106	Auto Charge 2000 Super Kit	Auto Charge 2000 PLC	Dual Bar Graph	Super Auto Eject 20	Yellow
51-03-1204	Auto Charge 1000 Super Kit	Auto Charge 1000 PLC	Single Bar Graph	Super Auto Eject 15	Red
52-03-4106	Auto Charge 1200 Remote Super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

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

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Kit Configuration Options

1. Select Charger Model
2. Select Charger Display

3. Select Display Bezel Color
4. Contact factory for your particular kit ordering information
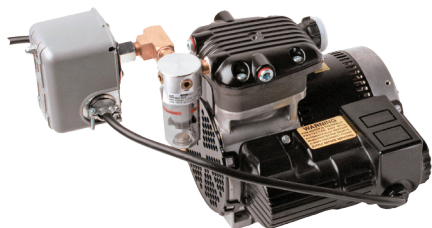
| Charger | Display | AC Compressor |

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

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

KITS AND PACKAGES

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

Call for Kit Part #

With Super Auto Eject Deluxe Cover Option

Kit Configuration Options

1. Select Charger Model
2. Select Display
3. Select Display Bezel Color
4. Select Auto Pump, with or without Auto Drain

5. Select 15A or 20A Auto Eject
6. Specify Back Wire (BW) (Super Auto Eject Only)
7. Select Color Cover for Auto Eject
8. Contact factory for your particular kit ordering information

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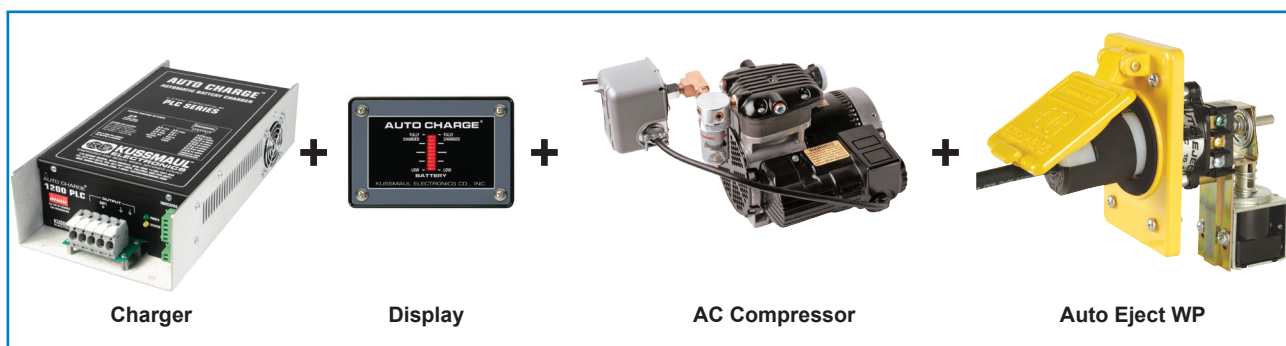
Part Number	Description	Charger	Indicator	Pump	Auto Eject	Color Cover
53-06-1106	Auto Charge 2000 Pump WP Kit	Auto Charge 2000 PLC	Dual Bar Graph	Auto Pump AC	Auto Eject 20WP	Yellow
51-14-1204	Auto Charge 1000 HP Pump WP Kit	Auto Charge 1000 PLC	Single Bar Graph	Auto Pump HP	Auto Eject 15WP	Red
52-10-4106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

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

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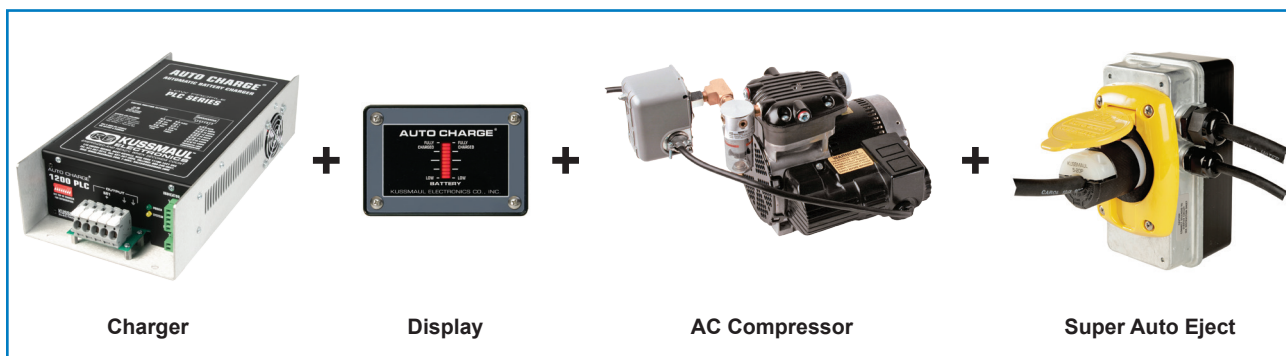
Part Number	Description	Charger	Display	Pump	Auto Eject	Color Cover
53-07-1106	Auto Charge 2000 Pump Super Kit	Auto Charge 2000 PLC	Dual Bar Graph	Auto Pump AC	Super Auto Eject 20	Yellow
51-15-1204	Auto Charge 1000 HP Pump Super Kit	Auto Charge 1000 PLC	Single Bar Graph	Auto Pump HP	Super Auto Eject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

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

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100 W

Features

- UP to 30 degrees of flexibility
- PERC technology
- 5 busbar technology which provides efficiency & durability
- ETFE Protection, extends the lifespan of the panel compared to non-ETFE panels
- 2 year product warranty

Benefits

- Keep up with vehicle loads without running the 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 radios

Kit Includes:

Solar Panel
- A 110W solar panel with 5 busbars and PERC (Passivated Emitter and Rear Contact) mono-crystalline cells, a special cell technology that increases module efficiency significantly over standard solar cells.

Charge Controller
- A 30A Pulse-Width Modulation (PWM) flush mounted charge controller is provided to charge and protect your batteries. Featuring an LCD screen, multi-stage battery charging, charging protections, two USB ports and real-time system indicators.

PV and Battery Cables
- Weather resistant and certified cables are provided to connect the solar panel to the charge controller and from the charge controller to the battery. The PV cables and battery cables, with a built-in fuse and ring terminals, built-in ferrule terminations for quick connections to the charge controller.

Mounting Hardware
- Mounting screws, cable clamps and tie wraps are included
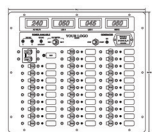
Expansion Kits
- Includes solar panel, mounting hardware and a pair of male and female branch connectors to connect solar panels in parallel.

Complete Heavy Duty Kits Designed for Emergency Vehicle Installation

Charge Controller

MC4-Type Connector

PV & Battery Cables

Mounting Hardware

Optional Waterproof Fitting

Part Number	Description	Electrical Data Specs		Dimensions			Wt.
		DC Volts	DC Amps	L	W	H	
781-0100-01	110W Solar Flex Kit	12	5.83	39.2"	26.4"	0.12"	5.5 lbs
781-0100-02	110W Solar Flex Expansion Kit	12	5.7	21.3"	41.8"	0.12"	4 lbs
007-2040-0	Optional: Waterproof Fitting. See page 84 for more options.						

For more power, visit our website where you will find Solar Max Kits.

Solar Power Charging

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Features

- 15% smaller and lighter compared to other popular brands
- Best in class 18% module efficiency, compared with 100W models of other popular brands
- PERC technology
- 5 year product warranty
- 5 busbar technology which provides efficiency & durability

Benefits

- Keep up with vehicle loads without running the 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 radios

Complete Heavy Duty Kits Designed for Emergency Vehicle Installation

Charge Controller

MC4-Type Connector
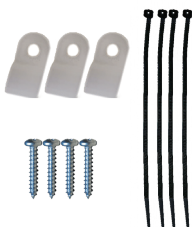
Mounting Hardware

PV & Battery Cables

Mounting Brackets
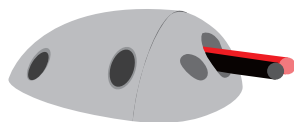
Optional Waterproof Fitting
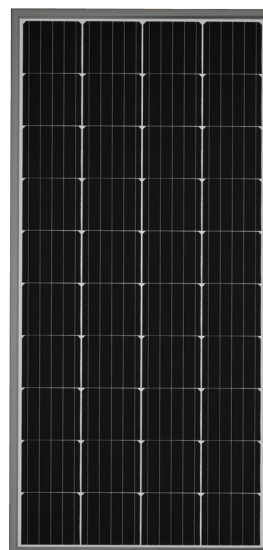
110W or 160W Panel

Kit Includes:

Solar Panel
- A 110W solar panel with 5 busbars and PERC (Passivated Emitter and Rear Contact) mono-crystalline cells, a special cell technology that increases module efficiency significantly over standard solar cells.

Charge Controller
- A 30A Pulse-Width Modulation (PWM) flush mounted charge controller is provided to charge and protect your batteries. Featuring an LCD screen, multi-stage battery charging, charging protections, two USB ports and real-time system indicators.

PV and Battery Cables
- Weather resistant and certified cables are provided to connect the solar panel to the charge controller and from the charge controller to the battery. The PV cables and battery cables, with a built-in fuse and ring terminals, built-in ferrule terminations for quick connections to the charge controller.

Mounting Hardware
- Mounting brackets, cable clamps and tie wraps are included.

Expansion Kits
- Includes solar panel, mounting hardware and a pair of male and female branch connectors to connect solar panels in parallel.

Part Number	Description	Electrical Data Specs		Dimensions			Wt.
		DC Volts	DC Amps	L	W	H	
780-0100-01	100W Solar Kit	12	5.21	33.1"	26.4"	1.2"	14.99 lbs
780-0160-01	160W Solar Kit	12	8.34	53.2"	26.4"	1.4"	23.15 lbs
780-0100-02	100W Solar Exp Kit	12	5.21	33.1"	26.4"	1.2"	14.99 lbs
780-0160-02	160W Solar Exp Kit	12	8.34	53.2"	26.4"	1.4"	23.15 lbs
007-2040-0	Optional: Waterproof Fitting. See page 84 for more options.						

SOLAR POWER CHARGING

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120 / 240 VAC EQUIPMENT

Stock Electrical Panels
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Auto Interlock II
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Auto Interlock IV
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Inverter - Chargers
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Inverters
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Specify Amperage Values and Labeling and We'll Assemble to Your Specifications

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

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

AC-IX
AC Master, 5 Circuits
5.25" x 7.50"
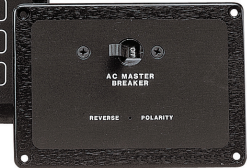
AC-II
AC Master
5.25" x 3.75"

ES-4
AC Master, 8 Circuits | DC 20 Circuits
17" x 12"

ES-5
2 AC Load Groups, 10 Circuits
DC Master, 24 Circuits
20" x 15"

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

ES-7
AC or DC Master, 16 Circuits
3.25" x 15"
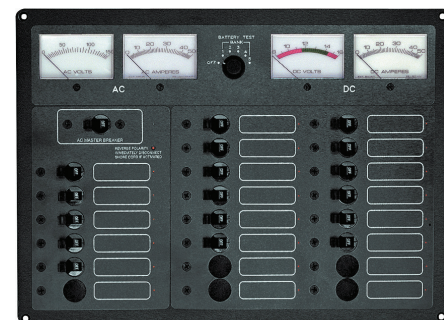
ES-3
AC Master, 6 Circuits | DC 16 Circuits
13.7" x 10"

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Electrical Panels to Match Your Precise Requirements
Send Us Your Sketch, and We'll Do the Rest CAD Drawings for Approval
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We make it easy for you, assisting layout and component selection:

1. UL listed components

2. Any size/shape panel face

3. Totally custom graphics, lettering, logos or language

4. Circuit breakers/switches/fuses

5. Indicator lights, audio alarms

6. Digital or analog meters/instrumentation

7. AC-DC

8. Back lighting

9. Fully assembled, partially loaded or panel blank

10. Pre-wired, ready for installation

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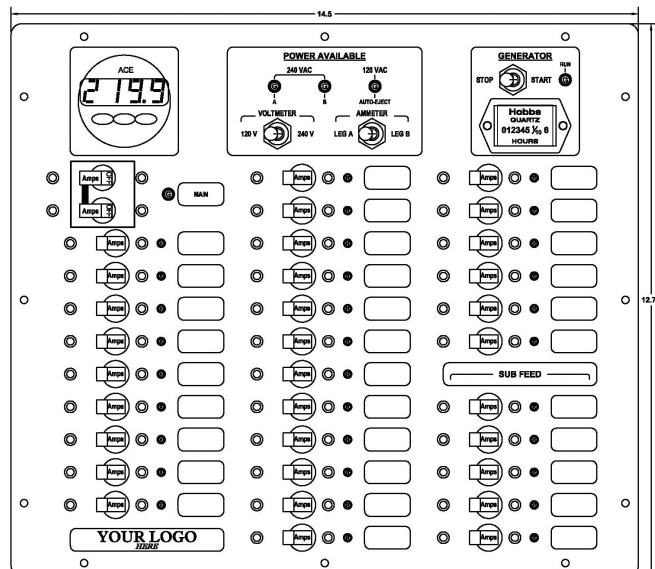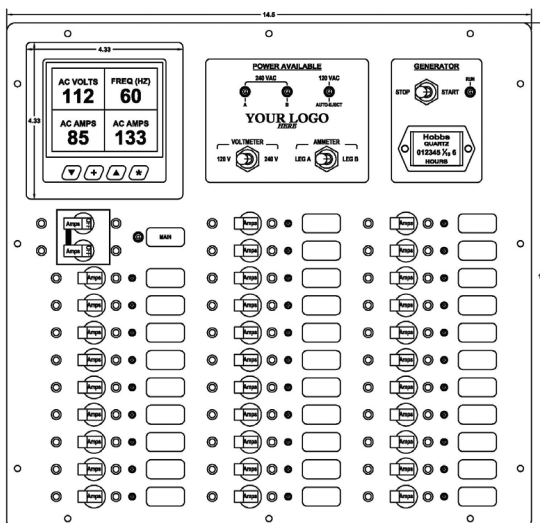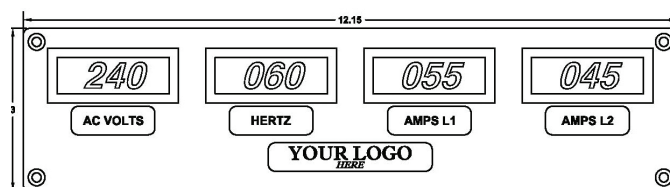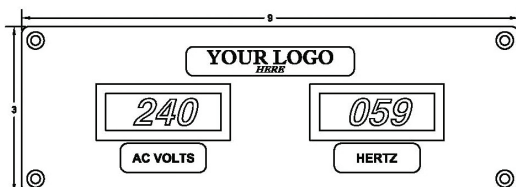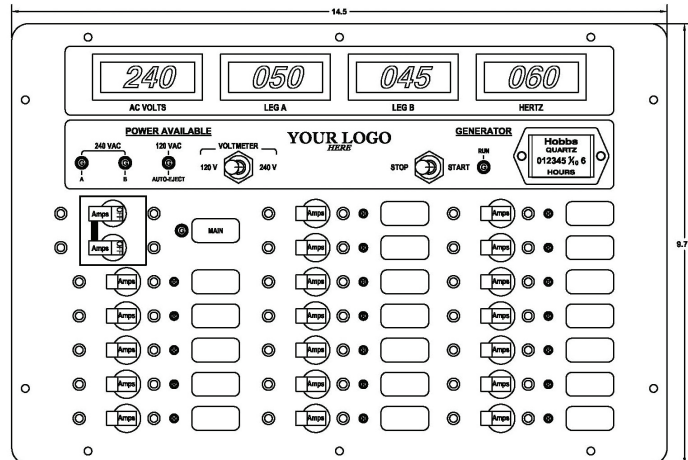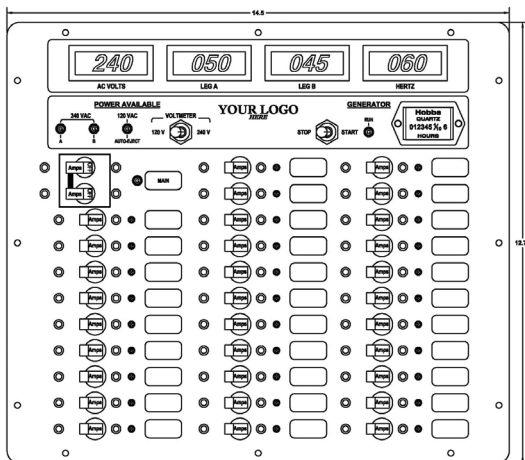
Transfer Load from Shore Power to Generator
Automatic Operation

Auto Interlock II

Features

- 20A, double pole relay
- Rapid relay transfer time
- Hard wire installation
- Indicator lights activate to identify the transfer switch position source (shore line or generator)
- Available for 120V and 240V operation
- Steel powder coated case

Part Number	Description	Electrical Data	Dimensions			Wt.
		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 includes generator and shore input cables with molded plugs
- Indicator lights activate to identify transfer switch position source (shore line or generator)
- 120V operation
- PVC case

Part Number	Description	Electrical Data	Dimensions			Wt.
		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 is adjustable from 2 seconds to 10 minutes, which allows the generator to warm up and stabilize before connecting to a load. The Auto Interlock IV is set at 24 seconds from the factory, please specify when ordering if modifications are required.

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

Auto Power 1500 Watt Inverter Charger with Built-in Battery Charger Pure Sine Wave Output

Features

- Inverter: 1500 Watt Continuous /4500 Watt surge
- Charger: 55 Amps Max
- Built-in automatic load transfer relay
- Pure Sine Wave
- Built-in high output 3 stage charger (1-hr boost) for rapid battery replenishment- programmable for various battery types; Gel, Lead Acid, or AGM battery
- Automatic over temperature shutdown, and AC output circuit breakers
- Auto Sleep Mode when the LED Display Panel is used, the inverter can be programmed to go to sleep after no load is detected over programmed interval
- Heavy duty powder coated steel construction and conformal coated circuitry
- Designed to meet NFPA-1917
- UL 458 Listed

NEW

Remote Display Options

**Bar Graph Display
091-200-IND**

**Status Center Display
091-194E-IND**

**Status Center Display
in Watertight Case
091-194E-IND-WT-XX**
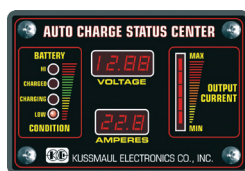
Color Options

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

**Super Auto Eject
Deluxe Cover-
Bar Graph
Model #:
091-55-234-XX**

**Super Auto Eject Deluxe
Cover- Digital Display for
AP 1500
Model #:
091-55-194E-XX**

**AP 2000 & 3000
Model#:
091-55-269-XX**

Part Number	Description	Electrical Data			Dimensions			Wt.
		Input	AC Out	Battery Charger Rating	L	W	H	
091-263-12-1500	Auto Power 1500	12V	1500W @120V	55A	15.25"	11.50"	7.125"	38.5
091-263-003-18	Optional- 18" Pigtail with Connectors (not shown)							
70-03-1306*	Auto Power 1500 Super Kit with 20A Super Auto Eject and Deluxe Cover in Bar Graph (Yellow)							
70-03-1406*	Auto Power 1500 Super Kit with 20A Super Auto Eject and Deluxe Cover in Digital Display (Yellow)							
*Popular Kit listed, contact factory for all other kit configuration options								

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Pure Sine Wave Output Inverter Chargers

Features

- **AP 2000 Inverter:** 2000W continuous/ 4000 watt surge
- **AP 2000 Charger:** 100 Amps
- **AP 3000 Inverter:** 3000W continuous/ 6000 watt surge
- **AP 3000 Charger:** 150 Amps
- Parallel stacking ability
- Pure Sine Wave
- Programmable for various battery types; Gel, Lead Acid, AGM battery or Custom (Lithium)
- Automatic over temperature shutdown, and AC output circuit breakers
- Temperature compensated charging for varying climate conditions (BTS cable included)
- Conformal coated circuitry
- Works with Super Auto Eject Cover with Digital Display model#: 091-55-269-XX, see p.30 & 40
- ETL Listed to UL 458
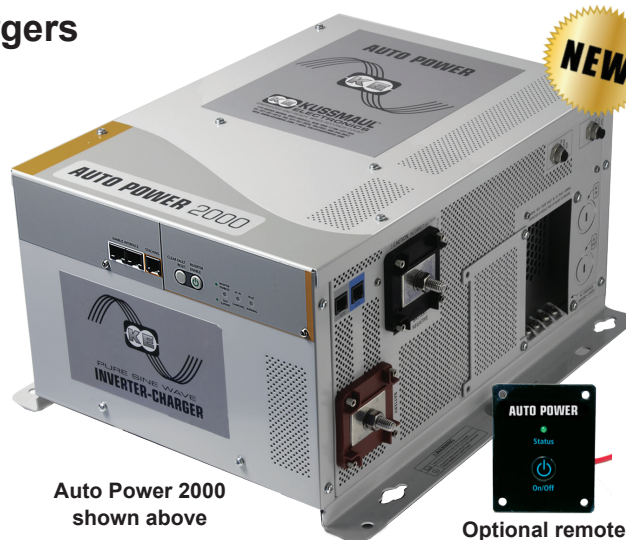
Auto Power 2000 shown above

Optional remote control display

Part Number	Description	Electrical Data			Dimensions			Wt.
		Input	AC Out	Battery Charger Rating	L	W	H	
091-269-12-2000	Auto Power 2000	12V	2000W @ 120V	100A	15.25"	13.50"	7.75"	60.5
091-269-12-3000	Auto Power 3000	12V	3000W @ 120V	150A	15.25"	13.50"	7.75"	60.5
091-269-005	Battery Temp Sensor Cable (included)			25 ft. cable				
091-269-006	**Optional:** Remote ON/OFF Switch Panel			16 ft. cable				
Kits available, please contact sales								

Pure Sine Wave Output Inverters

Features

- **Extended Surge Rating -** Surges to 2X continuous power for 2 seconds for motor loads
- **True Sine Wave AC Power -** For operation of sensitive and motor loads
- **Ignition Control -** Feature to turn inverter on/off via a 12 VDC signal and to minimize battery drain by switching the inverter off when the ignition key is turned off
- **Wide 10-18 VDC Input Range -** Ensures inverter operation on high voltage alternators found on many new vehicle chassis
- **Built-in 30A AC Transfer Relay -** Senses when outside AC Power is present and transfers the load from the inverter to the source of incoming power (shore or generator). The unit also automatically switches from invert mode to charge mode
- **Quick Installation -** Huge wiring bay for easy access and quick connect AC in/out terminals for fast & easy wiring

Optional remote control display

Freedom X, available in 1000W, 2000W & 3000W

Part Number	Description	Electrical Data			Dimensions			Wt.
		Input	AC Out Continuous	AC Out Surge	L	W	H	
817-1000	Freedom X 1000	12V	1000 W @ 40°C	2000 W	13.4"	9.1"	3.7"	11.5
817-2000	Freedom X 2000	12V	2000 W @ 40°C	4000 W	14.6"	10.8"	3.9"	14.7
817-3000	Freedom X 3000	12V	3000 W @ 40°C	6000 W	15.4"	10.8"	4.0"	16.5
808-0817-01	Optional: Freedom X/ XC remote panel with 25' Cable				5"	3"	2"	

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DC POWER MANAGEMENT

Mobile Data Power System

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

Brand Conversion From NEWMAR

Part Number	Description	Dimensions			Wt.
		L	W	H	
425-5750-0	MDP-25.0	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, the internal battery continues to provide supplemental power: 8A for 15 mins., 12A for 8 mins., and 18A for 2 mins.
- Timer disconnects the output 15 minutes after the loss of the input
- Absorbs line "spikes" and filters out electrical interference
- Configuration with the front panel power switch optional
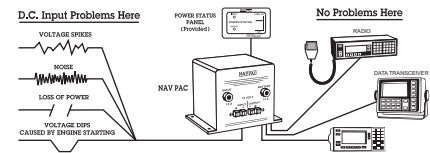
Part Number	Description	Dimensions			Wt.
		L	W	H	
425-2988-0	NP-12, 20A	7.40"	6.20"	5.25"	6

StartGuard™

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

Brand conversion from NEWMAR
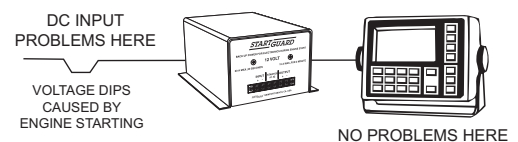
Part Number	Description	Dimensions			Wt.
		L	W	H	
426-3222-0	NS-12-20	3.50"	4.90"	8.25"	6

DC POWER MANAGEMENT

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Voltage Stabilizing Converters
Constant Output Voltage from Variable Input

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

Brand Conversion From NEWMAR

Part Number	Description	Electrical Data			Dimensions			Wt.
		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 loads that have difficulty operating from battery saver outputs

Part Number	Description	Electrical Data			Dimensions			Wt.
		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 a 20V-50V input to a 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 a high vibration environment onboard emergency and off-road vehicles
- 12V to 24V step-up converters also available

Brand Conversion From NEWMAR

Part Number	Description	Electrical Data			Dimensions			Wt.
		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

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High Efficiency, No Diode Drop
Eliminates Diode Isolator in a 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 off or the 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 0.7V 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 one input or it can be switched ON/OFF
- When any of the three batteries go above 13.2V all three batteries are paralleled by the solenoids being energized, charging all three batteries and will disconnect the batteries when the voltage drops below 12.6V

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

Solenoid

Part Number	Description	Dimensions			Wt.
		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

DC Power Management

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Load Manager P

- Preserves the Charge in the vehicle battery by two functions:

    - Timer disconnects the electronic loads after the engine shuts down

    - Battery condition sensor disconnects the loads when critical low voltage is sensed

- Timer and low voltage activation set points are user adjustable

Features

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

Part Number	Description	Electrical Data Specs		Load Shed Set-point 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 any accessories being left on and forgotten.

- Programmable disconnect time limit:15 minutes to 8 hours.

- Weatherproof enclosed case.

Features

- Dip switches on the top of the unit control time out programming
- LED's indicate output status
- 30A rating controls multiple auxiliary loads on the vehicle
- High and low voltage disconnect built-in
- Rugged construction; components epoxy potted for survival in vibration
- Optional ignition sense wiring restores the power immediately to radios when the ignition is activated, rather than having to start the 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.	3.7'	4.30"	2.13"	.5

DC POWER MANAGEMENT

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Load Manager 1H

- Monitors a 12V system and when detecting low voltage set-point, disconnects the load

- Automatically reconnects the load when the battery recovers 1.4V above disconnect set-point

- Preserves battery which prevents total discharge
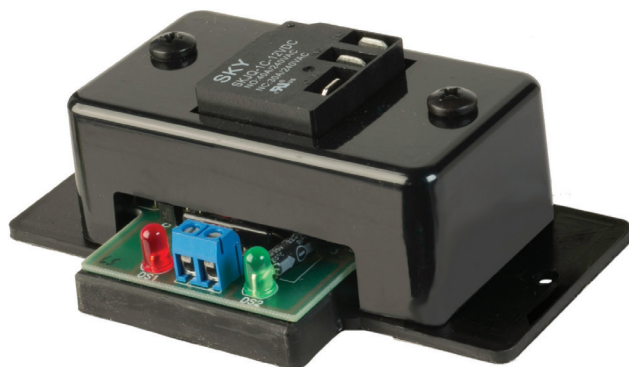
Features

- Preserves the batteries from totally discharging by disconnecting loads when the critical low voltage is sensed
- Reconnect sequence requires 1.4V recovery above the disconnect set point ensuring the battery condition improves before the loads are re-applied
- Field adjustable set and reconnect points for specific vehicle configuration
- Green/Red LED's indicate normal or low voltage conditions
- Easy to install compact case

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

Load Manager 1HP

- Low voltage disconnect preserves the batteries from totally discharging by disconnecting loads when the critical low voltage is sensed.

- Engine start sensor prevents nuisance disconnection due to low voltage occurring during the engine start.
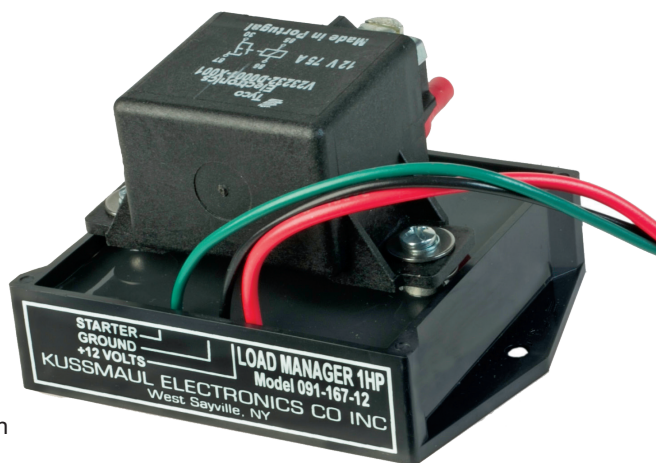
Features

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

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

DC Power Management

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Load Manager

- Sends output signals in half second sequences to energize and disconnect up to seven control relays (five programmable)

- Applies the load to the 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 any sensitive loads

- When activated by a master switch, load control signals are generated in sequential order in half second delays as programmed by the installer

- When the master switch is deactivated, loads are sequentially de-energized

- Monitors the vehicle for a low voltage condition and automatically sends a signal to sequentially disconnect up to five low priority loads which maintains the voltage to any critical equipment

- Manual override input provided

- Included: monitor panel alerts the operators when the load shedding has occurred due to low voltage

- 12V, 80 ohm signal output activates a standard vehicle lamp and auxiliary relays (lamp not included)

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 two circuits as the battery voltage decays

- Dedicates the battery power to the critical equipment under low voltage conditions

Features

- Ensures the most essential equipment has power priority over th

- Sequential circuit sheds the low priority loads first, ensuring longer run time for any critical equipment. This unit automatically resets when the voltage recovers and reconnects the high priority load first

- Prevents total discharge of the battery by disconnecting all the loads at critical low voltage set points

- Adjustable disconnect activation voltage set point

- 30A rating per circuit, 60A total (12V/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

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Soft Start

Features

- Automatically sequences lights ON/OFF
- Eliminates power surges and sags in the electrical system
- Controls lamp relays
- Easy installation

The **Soft Start** is a precision, solid-state controller, which sequentially switches "ON" seven loads at half 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 half second intervals. A plug-in connector simplifies the 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 a voltage dip and overshoot which may damage sensitive electronic equipment. The **Soft Start** assures the loads are applied and removed gradually, smoothing voltage variation and preventing any damage to sensitive loads.
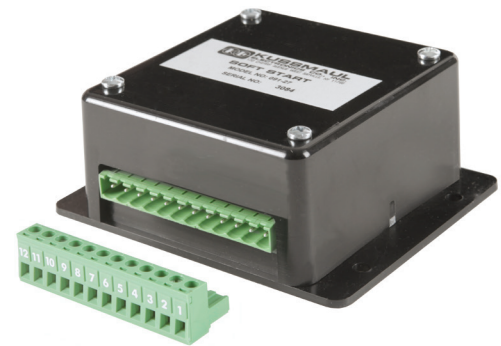
Part Number	Description	Dimensions			Wt.
		L	W	H	
091-27	Soft Start	4.25"	3.50"	1.50"	2

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
- 30A relay switches AC or DC loads
- Flexible triggering either +12V 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 1 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, 30A, 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 +12VDC or a contact closure to ground to initiate the timing cycle.

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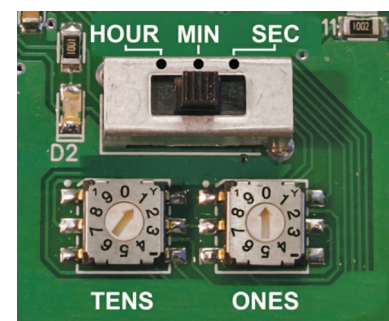
Part Number	Description	Dimensions			Wt.
		L	W	H	
091-214-12	Universal Timer, 12 Volt	4.75"	3.50"	1.60"	.5
091-214-24	Universal Timer, 24 Volt	4.75"	3.50"	1.60"	.5
091-214-120/240	120/240 VAC Adapter	N/A	N/A	N/A	.5

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Auto Current

Features

- Senses the current flowing in and provides a remote indication that a load is operating
- Simplifies vehicle wiring
- Single indicator activates from multiple 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 illuminate. 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 the indicator. Available as -G for operating indicator by grounding.

Part Number	Description	Electrical Data			Switch Rating 12V	Dimensions			Wt.
		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			Wt.
		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

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Auto Current F

Features

- Senses current flow
- Provides a remote indication
- Simplifies vehicle wiring
- Single indicator operated from many loads
- Produces flashing output signal to an 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 illuminate. 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 one second intervals providing a highly visible display.

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

| Part Number | Description | Electrical Data | | | Switch Rating 12V | Dimensions | | | Wt. |
		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 a warning indicator light
- Single indicator operated from multiple 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 the 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 the indicator. Available as -G for operating indicator by grounding.

| Part Number | Description | Electrical Data | | | Switch Rating 12V | Dimensions | | | Wt. |
		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

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UV OV Relay

Features

- Monitors system battery voltage
- Detects under voltage and warns of a possible dead battery
- Programmable 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 11.44V to 13.01V. Over voltage trip point programming is done with 8 possible settings ranging from 13.66V to 15.06V. These dip switches are easily accessed by removing a snap-on 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 troubleshooting, 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			Wt.
					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 a potential battery overcharge/boil over
- Relay contacts close upon over voltage being sensed, and ties to an 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 17V, reset at 14V, and may be adjusted to other voltage trigger points. The output relay is capable of switching 30A, and both "Normally Open" and "Normally Closed" contacts are provided.

Part Number	Description	Electrical Data				Dimensions			Wt.
		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

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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 12V 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 set-point and remains low for 120 seconds, the green LED is extinguished and the red LED illuminates. The set-point and time delay features meet the requirements of NFPA 1901, paragraph 9-3-3. Voltage set-point 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			Wt.
		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 remote turn ON/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. 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			Wt.
		DC Volts	DC Amps	L	W	H	
091-98-12	Alternate Action Relay	12	30	2.63"	4.00"	1.50"	.25

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Time Delay - DODO

Features

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

Time Delay Relay keeps a load energized for a set time interval after the load is de-energized. A typical application is to take control of the vehicle interior lighting to permit operators time for cleaning or maintenance. Both normally open and normally closed output contacts are provided (30A). The device requires three input connections: +12V power, ground and a +12V signal. When the signal is applied, the relay closes immediately. When the signal is removed, the relay remains energized for the designated time. 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			Wt.
		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 two or four relays
- 30A contacts
- LED's indicate when the relay is energized
- Normally closed and open contacts
- Use with a Load Manager
- Easy installation
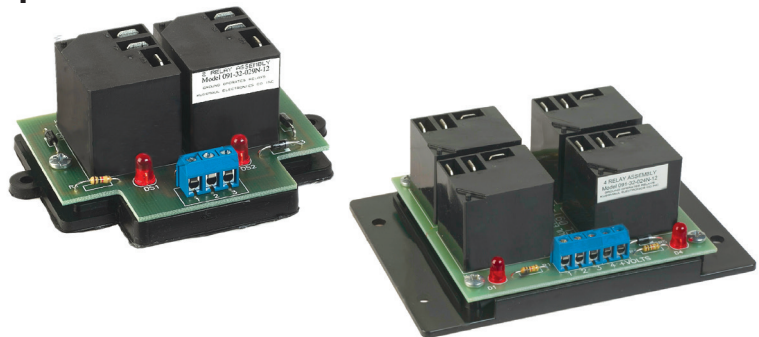
Choose either a two or four relay that simplifies installation and wiring. Relays are mounted and energized individually from the power supplied through the terminal strip. LED indicators adjacent to each relay illuminate whenever the relay is energized. Load circuits are connected directly to the top 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 are eliminated. Operation by either supplying voltage to the relay or grounding the relay coil. Models are available in 12V/24V.

Part Number	Description	# of Relays	Electrical Data		Com. Connection	Input to Operate	Dimensions			Wt.
			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

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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 six dedicated fused circuits configured in three load groups to power radios, emergency lights, sirens, video, MDT, radar, and more
- Flexible circuit activation/deactivation allows installer to set battery power use priority independently per two circuit load group:
  - Powered only with ignition
  - Timed disconnect
  - Always ON, with load group LVD
  - Always ON, with NO load group LVD
- Each circuit is fuse protected with a LED indicator which identifies the blown fuse position, simplifying troubleshooting
- Master low voltage disconnect protects batteries from an 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 mins. - 13 hours

Disconnect Range: 11.8-10.6VDC

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			Wt.
				L	W	H	
390-5711-0	PDS-100	6	100A Total, 20A Per Position	6.20"	5.20"	2.00"	2

DC POWER MANAGEMENT

INSTALLATION ACCESSORIES

Mounting Plate for
Auto Eject WP
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Super Auto Eject
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Air Eject, 12V
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Super 30 Auto Eject
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Mounting Plate for
Super 16 Auto Eject
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CCX Series
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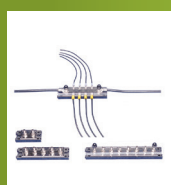
Bus Bars
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Terminal Strips
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Auto Eject Plates

- 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
120VAC

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

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

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

091-185-011
for Air Eject
12V

091-185-013
for Air Eject
24V

091-228-002-120
for indicator and
Super Auto Eject
120V

091-228-002-240
for indicator and
Super Auto Eject
240V

Charger/Pump Mounting Plates

- Simplifies Installation and Removal
- 1/8" Aluminum with Charger and Vehicle Mounting Holes
- Pump Plates Have Integral Vibration Mounts
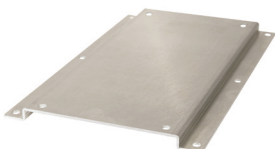
091-185-006
E-Z Mounting Plate Small
Auto Charge 11
Auto Charge 12
Euro Charge I
Euro Charge II
Pump Plus HO
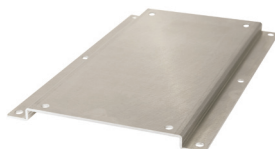
091-185-007
E-Z Mounting Plate Medium
Auto Charge 20
Auto Charge 12 HO
Auto Charge 12 PIM
Euro Charge III
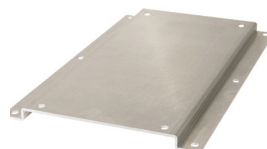
091-185-008
E-Z Mounting Plate Large
LPC 40
Auto Charge 1200
Auto Charge 1200 Remote
Auto Charge D, D2
Auto Charge 4000
Pump Plus 1200
Auto Charge D Pump Plus
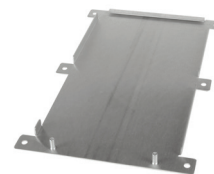
091-200-EZM
E-Z Slide Mount Plate Large
LPC 40
Auto Charge 1200
Auto Charge 1200 Remote
Auto Charge D, D2
Auto Charge 4000
Pump Plus 1200
Auto Charge D Pump Plus

Air Compressor Mounting Plates
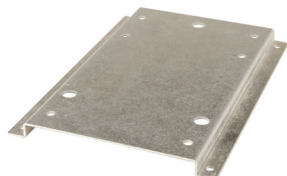
091-9H-1
Auto Pump AC Mounting Plate
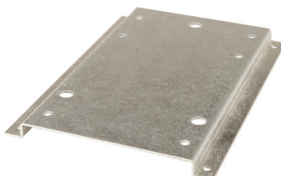
091-9HP-H
Auto Pump AC HP Mounting Plate
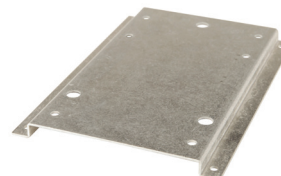
091-9-12V-HP-H
Auto Pump 12V & 12V HP Mounting Plate

INSTALLATION ACCESSORIES

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Waterproof, High Amperage Surface Mount Circuit Breakers

Features

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

Part Number	Description	Volts	Amps	Max Interrupt Current	Dimensions			Wt.
					L	W	H	
090-0030-0	WBS-30	42V	30A	3000A	2.88"	1.88"	1.75"	.25
090-0040-0	WBS-40	42V	40A	3000A	2.88"	1.88"	1.75"	.25
090-0050-0	WBS-50	42V	50A	3000A	2.88"	1.88"	1.75"	.25
090-0060-0	WBS-60	42V	60A	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 the surface with two #10 flat head screws or bolts (not included)
- Clear lexan cover insulates the conductive parts
- Accepts industry standard ANL tin-plated copper fuses, purchase separately. 80-500A ratings
- See through mica element in the fuse body for easy identification of a 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: 80, 100, 150, 200, 250, 300, 350, 400, 500
All ANL fuses rated to 80V DC	

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PX Series **Waterproof Junction Boxes**

Features

- Ideal for wiring connections onboard emergency vehicles where wire connections are subject to outside conditions
- Made from rugged, non-corrosive, high impact polypropylene
- Snap-on cover provides a watertight seal
- "Universal" cut-to-fit (see diagram) cable entries accommodate a wide cable range
- Multiple connect strips with "captive" screw compression wire terminals installed
- Multiple knockouts provided for conduit access (in addition to cable entries)
- IP54 IEC Waterproof Rating
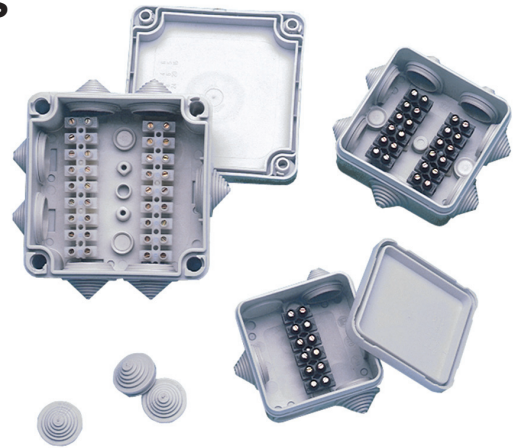
Part Number	007-3001-0	007-3002-0	007-3003-0
Description	PX-1	PX-2	PX-3
Number of Connector Strips	1	2	2
Positions per Strip	6	6	9
Max Wire Gauge	16	16	16
Number of Cable Entry Points	5	7	7
Number of Cable Entries Installed	3	7	7
Spare Cable Entries Provided	2	0	0
Cable Diameter Range (Inches)	0.14 - 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
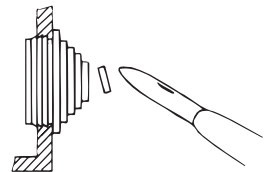
BX Series Weatherproof Junction Boxes

Features

- Provides secure, weatherproof protection of the wiring connections
- Rugged cast aluminum box with white enamel finish
- Easy wiring access through multiple grommeted cable entries
- Removable connector strips secure conductors with compression screws - no terminals required, see the matrix below for the number of connector positions and wire gauges
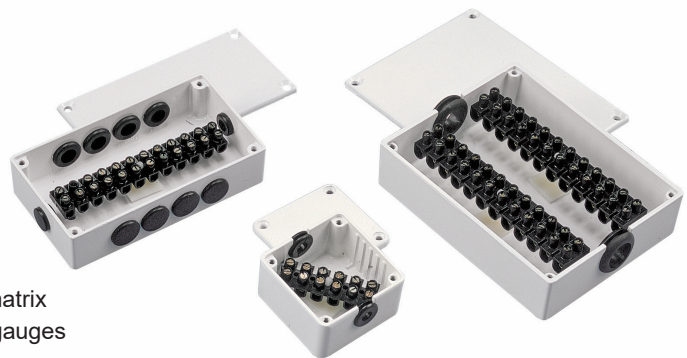
Part Number	007-6001-0	007-6002-0	007-6003-0
Description	BX-1	BX-2	BX-3
Number of Connector Strips	1	1	2
Positions per Connector Strip	6	12	11
Max Wire Gauge	16	16	14
Max Amps (per position)	6	6	10
Cable Entry Points	2	8	2
Max Cable Diameter	0.25"	0.37"	0.59"
Box Size	2.0" x 2.0" x 1.2"	4.4" x 2.4" x 1.2"	4.7" x 3.7" x 1.3"

INSTALLATION ACCESSORIES

Waterproof Fittings - RA Series Right Angle

Features

- Route cables at a 90° angle through vertical and horizontal surfaces. A low profile design keeps the cable secured and close to the surface
- Molded of nylon, the Sculpted shape doesn't have sharp edges and provides a radiused 90° feed-thru bend in the cables without damage
- Easy installation: slide the silicone compression rings on the cable, mount the base piece with the waterproof gasket, then attach the 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
007-2040-0	RA-7	(2 x) 0.1" - 0.23"	3.23 x 2.44 x 0.95

Waterproof Fittings - CCX Series

Features

- Create a 100% waterproof seal when routing cables through vehicle roofs
- Allowing installation/removal with a connector still attached
- Entry hole is pre-drilled in a seal with a slit to edge allowing feed-thru of the cable with a 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 bar, 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"
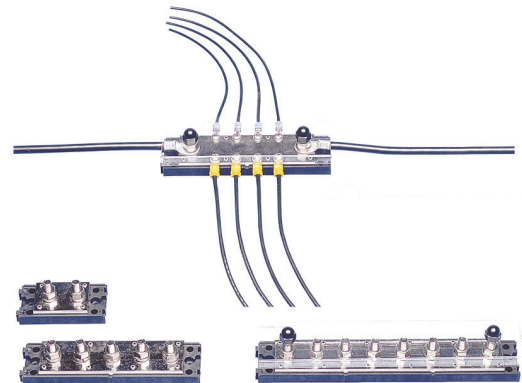
Terminal Strips

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"

INSTALLATION ACCESSORIES

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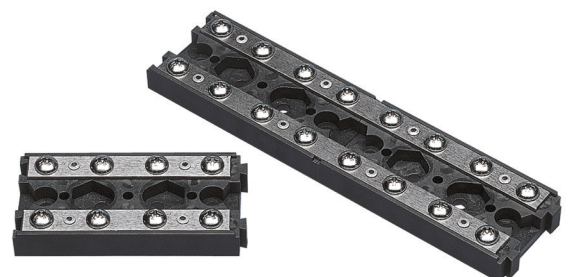
ENGINE / VEHICLE ACCESSORIES

Auto Reel Page 86	Power Cord Reel Page 86	Air Line Reel Page 86
R.F. Control Page 87	Safety Lock Page 88	Safety Lock 3 Page 88
Safety Lock 4 Page 88	Safety Lock D Page 88	Auto Throttle 1 Page 88
Radio Chargers Page 89	7 Door Display Page 90	10 Door Display Page 90
Relay Output Page 90	Audible Annunciator Page 90	Switch Enclosure Page 90
Data Port Page 91	USB Dual Ports Page 91	Auto Touch Page 92
Temperature Monitor Page 92	Shoreline/Air/ Level Alarms Page 93	Bluetooth Module Page 93
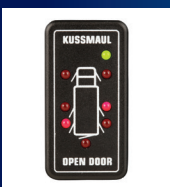
SECTION 10 - ENGINE / VEHICLE ACCESSORIES

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Auto Reel

Features

- After the Auto Eject is ejected from the receptacle, the Auto Reel automatically retracts the cord to a pre-determined stop point
- Eliminates damage to the plug/cord from vehicles movement
- With the Auto Safe option: After the cord is disconnected, the power is shut off to prevent any electric shock if the cord gets severed/wet
- Spring retractable with latch
- Wall or ceiling mount
- 45 foot, #12 AWG 3 conductor cord
- Adjustable cord stop

Auto Safe

Auto Reel

Auto Eject (not included)

WARNING

AUTO RETRACT

See pages 33-38 for more information on Auto Ejects
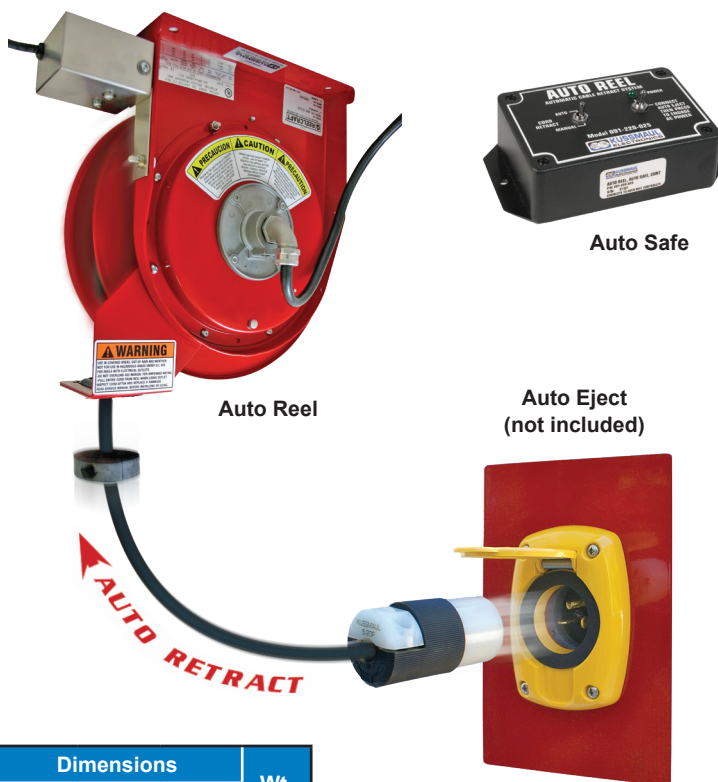
Part Number	Description	Electrical Data		Dimensions			Wt.
		AC Volts	Amps	L	W	H	
091-220-20-120	Auto Reel	120	20	12.00"	14.00"	10.00"	28
091-220-20-120-AS	Auto Reel w/ Auto Safe	120	20	12.00"	14.00"	10.00"	28

Power Cord Reel
AC Cord Reel for Auto Ejects

Features

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

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

Air Line Reel
Air Line Reel for Air Ejects

Features

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

Part Number	Description	Wt.
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 four unique signals
- Typical transmitter range: 155 feet
- Station mounted AC powered receiver actuates up to four in-building systems/accessories
- Multiple transmitter codes permit: setting unique frequencies for up to 32 vehicles, and assigning dedicated controls per vehicle, per single bay or area
    - Set common station activation frequency for all vehicles
- Code entry dip switches

Transmitter

Receiver

Part Number	Description	Electrical Data		Output Channels	Trans. Codes	Dimensions			Wt.
		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

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

Features

- Safety lock activated when the ignition key is removed
- When the safety lock activates, the engine remains on and shuts down automatically if the controls are manipulated in an attempt to move the 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 the ignition key is inserted
- 30A relay contacts

Safety Lock D
091-174
For Chrysler / Jeep / Dodge Vehicles
2006 to 2008
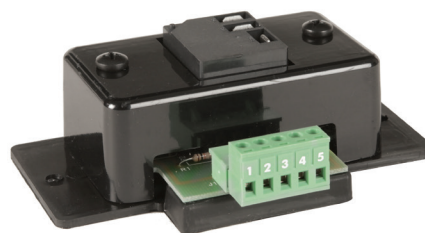
Safety Lock
091-148-12
Single Wire Ignition Output

Safety Lock 3
091-155
Three Wire Ignition Output

Safety Lock 4
091-160
Four Wire Ignition Output

Part Number	Description	Electrical Data		Dimensions			Wt.
		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 / Jeep / Dodge Vehicles							

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 20A 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 12.5V, 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 13.4V, 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

In-Vehicle Charging Solutions for Two-Way Radio Batteries

Features

- K-Line Chargers designed for in-building or in-vehicle with available accessories
- Replaceable charging pods charge Li-Ion, LiPo, NiMH, or NiCd batteries based on the pod selected
- Models are available for charging one (K1M), two (K2M), six (K6M) or 12 (K12M) batteries and the battery may be charged while on or off the radio
- K-Line chargers can be powered by AC as well as 12 or 24 volt DC power
- Available for popular radios including Motorola, Kenwood, Harris, Tait, Hytera, Icom, and many others
- Two year warranty

Model: 500-K1M-XX

Optional:

Mounting Bracket for K-Line Models Call for more Information

Model: 500-K12M-XX

Model: 500-K6M-XX

Model: 500-K2M-XX

Part Number	Description	Electrical Data Specs			Compatible With	Dimensions			Wgt (lbs)
		Input AC	Input DC	Charge Rate		W	L	H	
500-K1M-XX	One Unit Charger	N/A	12V-24V	up to 900 mA	Li-Io / LiPo NiMH / NiCd	3.8"	5.2"	3.0"	0.6
			1.0A (min)						
500-K2M-XX	Two Unit Charger	100-240 VAC	12V-24V	up to 900 mA	Li-Io / LiPo NiMH / NiCd	3.9"	5.4"	3.2"	0.7
		.058A	1.8A (min)						
500-K6M-XX	Six Unit Charger	100-240 VAC	12V-24V	up to 900 mA	Li-Io / LiPo NiMH / NiCd	20"	5.8"	3.6"	3.1
		2A	5.4A (min)						
500-K12M-XX	Twelve Unit Charger	100-240 VAC	12V-24V	up to 900 mA	Li-Io / LiPo NiMH / NiCd	20"	5.8"	3.6"	3.6
		2.2A	12.5A (min)						
(XX) Indicates pod									

Vehicle Only Chargers

Features

- Ultra-rugged for Motorola APX6000 / 7000 / 8000 radios
- High impact and vibration tolerant contacts designed for rough driving conditions
- Variety of mounting options
- Models are available for charging one battery (500-KVOAPX1) and 4 batteries (500-KVOAPX4)
- Chargers can be powered by 12 or 24 volt DC power
- Two year warranty

Model: 500-KVOAPX4

XLR Cable for 500-KVOAPX4 shown here

Model: 500-KVOAPX1 (Radio not included)

Part Number	Description	Electrical Data Specs		Battery Voltage Range	DC Power Cable	Dimensions			Wgt (lbs)
		Input	Charge Rate			W	L	H	
500-KVOAPX1	One Unit Charger w/ locking XLR connector cable	12V-24V	up to 1000 mA	7.2V -10.8V	16 AWG	4.4"	2.7"	2.3"	0.5
		1.0A (min)							
500-KVOAPX4	Four Unit Charger w/ locking XLR connector cable	12V-24V	up to 1000 mA	7.2V -10.8V	16 AWG	16.0"	10.0"	4.5"	7.3
		4.0A (min)							

ENGINE / VEHICLE ACCESSORIES

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USB EZ Mount Assembly

Features

- Dual USB Charging Port with 12V accessory output
- 4.8 Amps allows charging of both smart phone and tablet at same time
- Can be connected to 12V or 24V switched ignition or direct to battery

Switch Enclosure

Features

- Heavy duty enclosure
- SVR switches snap in (accepts switches with pigtail leads only)
- Easy to mount
- Mounts on top or underneath dashboard
- Choice of 3 colors

Red

Black

White

(Switches not included)
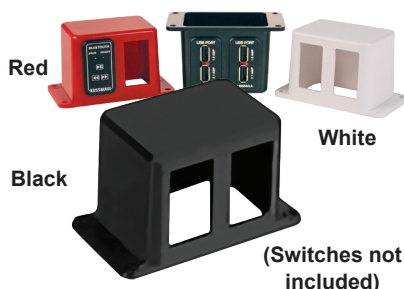
AUX / USB Pass Through

Features

- Front Panel -USB Type-A Receptacle (4 pin), 3.5 Stereo Jack (3 pin)
- Back Panel - 6' USB Type-A plug, 6'.3 Stereo plug

Available with Weatherproof door see page 91

Part Number	Description	Dimensions			Wt.
		L	W	H	
091-219-5-038-1	USB EZ Mount Assembly Plate	3.1"	7.5"	5.5"	1.5 lbs
091-255	Switch Enclosure	3.72"	2.06"	2.18"	.10
091-249	Audio / USB Pass Through	1.73"	0.98"	1.73"	.25
092-249-WP	Audio / USB Pass Through with Weatherproof door	1.73"	0.98"	1.73"	.25

Open Door Indicator Panels
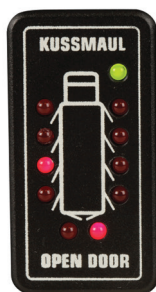
10 Door
091-178-10A

7 Door
091-178-7A

Features

- Choose 10 or 7 door LED display
- Door/compartment 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.)

Optional Audible Alarms

Relay Output
091-178-9

Audible Annunciator
091-178-8

Features

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

Part Number	Description	Input Power	Dimensions			Wt.
			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

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3.1 to 4.8 Amp Max Output Allows Charging Of Two Smart Phones or Tablet And Smart Phone 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
- 3.1 can be connected to a 12V switched ignition or directly to the battery
- 4.8 can be connected to 12 or 24V switched ignition or directly to battery, can charge phone and tablet simultaneously
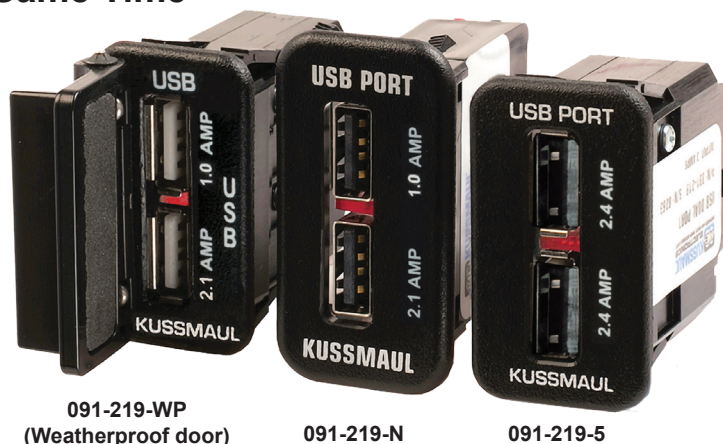
091-219-WP (Weatherproof door) **091-219-N** **091-219-5**

Part Number	Description	Electrical Data			Dimensions			Wt.
		Input Volts	Output Volts	Output Amps	L	W	H	
091-219	USB Dual Port	8-18 VDC	4.8-5.2 VDC	3.1 Amps	1.73"	0.98"	1.73"	.25
091-219-WP	USB Dual Port with Weatherproof door	8-18 VDC	4.8-5.2 VDC	3.1 Amps	1.73"	0.98"	1.73"	.25
091-219-N	USB Dual Port (NGR)	8-18 VDC	4.8-5.2 VDC	3.1 Amps	1.97"	1.02"	1.79	.25
091-219-N-WP	USB Dual Port (NGR) with Weatherproof door	8-18 VDC	4.8-5.2 VDC	3.1 Amps	1.97"	1.02"	1.79	.25
091-219-5	USB Dual Port 4.8 with terminal connectors	10-30 VDC	4.8-5.2 VDC	4.8 Amps	1.73"	0.98"	1.73"	.25
091-219-5-010	USB Dual Port 4.8 with wires (pigtail lead)	10-30 VDC	4.8-5.2 VDC	4.8 Amps	1.73"	0.98"	1.73"	.25
091-219-5-WP	USB Dual Port 4.8 with Weatherproof door	10-30 VDC	4.8-5.2 VDC	4.8 Amps	1.73"	0.98"	1.73"	.25

Provides Access To Router Or Telephone Line

RJ 45 Features

- Provides access to a router
- Designed for easy installation in the vehicle's switch panel
- 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

RJ 11 Features

- Provides access to a telephone port
- Designed for easy installation in the vehicle's switch panel
- Standard RJ11 Connector
- 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
091-227-RJ11	Telephone Port	RJ11		-50°F to +150°F	1.73"	0.98"	1.73"	0.25

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Touch Sensitive Switch

Features

- Low side switch
- Touch-On / Touch-Off switch
- Built-in LED illuminates when the switch is on
- Lexan® front panel designed for years of durability
- Reverse polarity protected
- Designed for easy installation in the vehicle's switch panel
- Available as a toggle or momentary switch
- Time delay option also available

Part Number	Description	Electrical Data			Dimensions			Wt.
		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
091-222-TD-1	Auto Touch, Timed Delay	8-20	0.020 Amps Max	5.0 Amps Max	1.73"	0.98"	1.73"	.25

Temperature Monitor

Features

- Designed for easy installation in the vehicle's switch panel
- Large 7 segment green LED display
- Reverse polarity protected
- Easy connection to a 12V or 24V switched ignition
- Temperature monitor blinks at 32° F and below to indicate roads may be icy

Remote Sensor with 16' cable included with Temperature Monitor

Mini Battery Voltage Meter

Features

- Monitors battery voltage
- Large 3 digit green LED display
- Reverse polarity protected
- Easy connection to a 12V or 24V switched ignition

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
091-250-12	Mini Voltage Battery Meter	12	0.4A	1.73"	0.98"	1.73"	0.25
091-250-24	Mini Voltage Battery Meter	24	0.5A	1.73"	0.98"	1.73"	0.25

Clock

Features

- 24 hour display (military time)
- OLED display
- Hour/Min using tactile switches
- Display may be switched with ignition to turn "ON" or 'OFF' or to set to stay on continuously
- Easy connection to a 12V or 24V switched ignition

NEW

Part Number	Description	Electrical Data		Dimensions			Wt.
		DC Volts	DC Amps	L	W	H	
091-257	Switch Clock	10-30	0.0065	1.73"	0.98"	1.73"	0.25

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Shore Power / Air Alarm / Level Alarm Audible Alarms with LED

Features

- 85dB alarm
- Built-in LED indicator
- Shore Power Alarm: Alerts Driver to disconnected Shore Line
- Air Line Alarm: Alerts Driver to disconnected Air Line
- Level Alarm: Optional audible alarm for Kussmaul Auto Level (p.31), Alerts driver to vehicle level with high decibel beeping
- Designed for easy installation in the vehicle's switch panel
- Reverse polarity protected
- Audible alarm sounds with illuminated LED

Part Number	Description	Electrical Data		Dimensions			Wt.
		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
091-248-E	Air Line Alarm, Eaton Euro	10-16	30mA	1.98"	1.02"	0.45"	.25
091-248-N	Air Line Alarm, Eaton NGR	10-16	30mA	1.98"	1.02"	0.45"	.25
091-248-S	Air Line Alarm, Eaton SVR	10-16	30mA	1.73"	0.83"	1.73"	.25
091-260-S (Available in 24V)	Level Alarm, *Optional* Audible Alarm for Auto Level (p.31)	10-16	30mA	1.73"	0.83"	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 the 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 the vehicle's switch panel
- Easy connection to a 12V switched ignition
- Optional mic is available

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
091-226-007	Optional Mic						

ENGINE / VEHICLE ACCESSORIES

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To: All Our Valued Customers

Please contact us regarding any questions or clarifications regarding product selection, installation, function, warranty, et al. Our knowledgeable and experienced staff is well versed in emergency vehicle electrical systems, components, and product applications, so please contact us. If you experience issues 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 online at **Kussmaul.com** on the **CUSTOMER SUPPORT** page and click on the **WARRANTY POLICY**.

Please contact us at 800-346-0857, if you experience any problems with any of our products. In many cases, we can trouble-shoot and resolve the issue over the phone. If sending the unit in is required, please visit our **CUSTOMER SUPPORT** section on our website, **Kussmaul.com** and click on the **RETURNS** link. Once the return part is received at our facility, our staff is committed to repairing and returning it to you within 3 business 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 cost and support our repair work with a 6-month warranty. We have been producing chargers for 50 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 at rate repair fee, and we 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 free return shipping. If your Compressor is more than 1 year old, we have a flat rate repair fee, and we support our repair work with a 3-month warranty. These pumps can be rebuilt by either our technical support staff or we can supply you with a rebuild kit.

Electronic Displays and Accessories:
Displays and indicators use long-life LED's and thus rarely need replacement. If a malfunction does occur, some units can be repaired while others need to be replaced. Contact us and we will advise you the best course of action. If a malfunction occurs within 3 years of installation, we will replace or repair it free of charge. Other accessory products contain relays, which may wear out over time and can be repaired. These too will be repaired at no charge within 3 years

We remain faithfully in your service.

Dale Tompkins

Dale Tompkins, President

KUSSMAUL ELECTRONICS™

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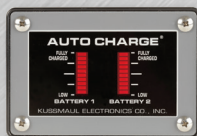
SECTIONS

1) Battery Charging

Battery Chargers
Battery Savers

6) Solar Power Charging

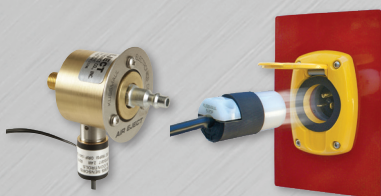## 2) Battery Indicators/ Meters

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