

10-1006

For utility, industrial and other standby applications

### ARR-M SERIES FLOAT CHARGERS

Simplified operation, minimum maintenance, long, economical service... are a few of the advantages you get with a three-phase, high-power ARR-M charger. Electrical and mechanical design features make it ideal for a wide variety of utility, industrial and other standby power supply applications.

### INPUT AND OUTPUT RATINGS

Standard Inputs: 208, 240, 480VAC, three phase, 60Hz, 6-Pulse, Filtered output.

575, 600 VAC, and other 3-Phase Input Voltages available, also 50Hz models available-consult the factory.

12-Pulse models available for 60Hz and 50Hz - please consult the factory

Output Voltages: 24, 48, 125, 250VDC  
Output Amperage: 25A - 500A  
(up to 1000A available - consult the factory)

### ELECTRICAL FEATURES

**Standard Control Modules**  
All three-phase ARR-M chargers, regardless of output voltage & current utilize the same control. This feature allows for minimum parts inventory and simplifies maintenance.

**Regulation**  
DC float voltage is maintained within  $\pm 0.5$  percent from no load to full load with input frequency variations of  $\pm 5$  percent and with AC input voltage variation of  $+10\%/ -12\%$  of the nominal input voltage.

During operation the maximum output transient does not exceed 6% of the initial steady-state voltage for sudden load changes between 10% and 90% of rated output. Recovery takes less than 300 milliseconds.

**Current Limiting**  
The current limiting circuit is factory set at 100 percent and is adjustable from 20 percent up to 100 percent of rated output. It will hold down to short circuit.

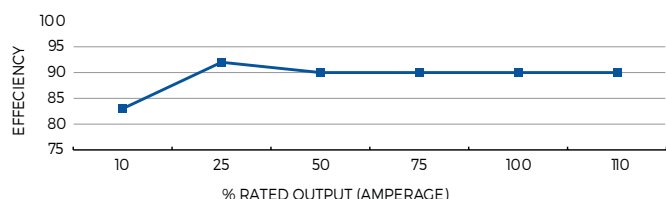
### FIVE YEAR WARRANTY



### FEATURES & BENEFITS

- Microprocessor Controlled
- Digital Metering
- Simultaneous Voltage & Current Readings
- 24, 48, 125 & 250 volt models\*
- 25A to 500A models\*
- Listed to UL/CSA
- CE safety and EMC standards tested and compliant \*\*
- Designed to NEMA PE5 standard insures reliable performance under real world conditions
- Low Maintenance
- Common control board for all output voltages and current ratings reduce spares requirements and simplifies maintenance.
- Remote Communications - MODBUS & DNP3
- User definable control and alarm set points
- Temperature Compensation
- High efficiency & power factor
- Design provides for reliable power requirements on or off the battery

\* Other models available – please consult the factory. \*\* 50Hz models



#### Power Factor

The typical power factor is 0.88 when tested on a resistive load and batteries.

#### Electrical Noise – Filtered Output

Nominal ripple when connected to a battery rated four times the charger output current rating:

- 24V & 48V Models – 30mV or less (32dBrc) (15mV available with extra filtering)
- 125V Models – 100mV (30mV available with extra filtering)
- 250V Models – 200mV (150mV available with extra filtering)

#### Off-battery Operation

The ARR-M product series can be operated on a principally resistive load with the battery disconnected for maintenance purposes.

#### Circuit Protection

- Selection of input AC circuit breakers to suite input voltage and capacity as specified by client.
- 10kAIC and higher capacity rating of output DC circuit breakers available.
- Also, a single pole DC fuse is provided in the positive leg of the DC output.
- Surge suppression on input and output for protection of the transient voltages.
- Optional lightning arrestor available for over-voltage transients caused by external lightning.
- Reverse polarity.

### ENVIRONMENTAL CONDITIONS

#### Ambient Operating Conditions

The ARR-M series chargers will operate at 100% of rated DC output, continuously in ambient temperatures of 32°F to 122°F (0°C to 50°C) up to an altitude of 3,300 ft. (1,000m). De-rating of 3.6°F (2°C) for every 990 ft. (300m) over 3,300 ft. above sea level. These units can be safely stored for up to one year at temperatures ranging from -40°F to 185°F (-40°C to 85°C).

#### Humidity

The ARR-M series chargers will continue to operate in humidity levels of 0-95% (non-condensing).

#### Audible Noise

45-65 dBA at 3 ft. (1m) from any vertical surface of the charger.

### MECHANICAL FEATURES

- Enclosure – NEMA-1 (IP20), steel with hinged front panel door
- Finish – Baked powder coat; ANSI-61 Gray
- Cooling – Natural convection cooling up to 100A output current; forced air assisted cooling for units above 100A output current
- Door opens approximately 90 degrees for easy access to interior
- Control board mounted on backside of door for easy access
- Serviceable components are accessible and removable from the front
- Knockouts for cables are provided
- Cabinets are floor mounted and provide a 3 inch clearance at the bottom to facilitate handling by a lift truck or pallet truck
- Two half turn screw terminals are provided for standard door fastening

### DESIGN FEATURES

- Listed to UL/ANSI 1012
- NEMA PE5 complaint
- CSA C22.2 107.1 certified and applicable IEC standard compliant
- 30 year design life
- MTBF – 300,000 hours
- MTTR – less than one hour

### STANDARD FEATURES

- Microprocessor controlled
- Digital Display: 2 line by 20 characters; simultaneous display of voltage and current with 0.5% accuracy
- High Voltage Shutdown
- Common charger fail (two sets of form-c contacts)
- Float and Equalize settings are via keypad
- Individual current limit setting for Float and Equalize
- Front Panel Indicators
  - Charger fail LED: Red (flashing)
  - AC on LED: Green
- Event Log: last 150 charger events
- Equalize Timer – 1 to 4095 Hours (one hour increments)
- Periodic Equalize - 1 to 4095 Days (one day increments)
- Consult the factory for Hi Capacity Breakers.
- Charge Modes
  - Float – Manual & Automatic
  - Equalize – Manual & Automatic
  - Anti-depressant – Ni-cad batteries
  - Formation – battery restoration

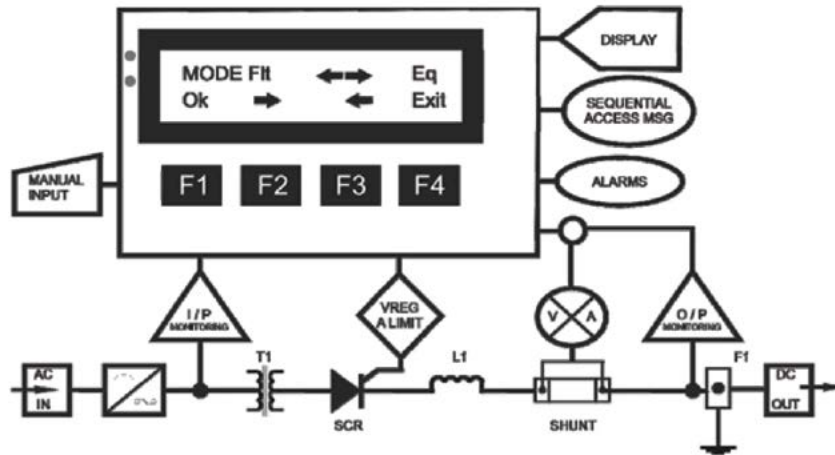
### STANDARD ALARM PACKAGE

- Rectifier Fail
- Battery High DC Voltage
- Battery Low DC Voltage
- Charger High DC Volts
- Charger Low DC Volts
- Ground Fault (POS)
- Ground Fault (NEG)
- AC Fail
- Charger Fail (Summary)
- Rectifier Fail
  - Rectifier Fail is triggered by low DC current (2% of rated output), AC Fail, and decaying DC voltage

### ADDITIONAL ALARM FEATURES

- 2nd Level Battery High DC Voltage
- 2nd Level Battery Low DC Voltage
- End of Discharge Alarm
- Rectifier High Current Alarm
- Equalize Alarm
- Charger Over-temperature Alarm

Alarms noted above default values are disabled; these alarms, when required, must be specified on the order.



ARR-M 24VDC PRODUCT RATINGS (\*)

| Charger Model (F - Filtered Output) | Output Current (Amps) | Input Volts / Input Current |      |      | Shipping Weight (Lbs) | Heat Loss |      | Charger Enclosure (Standard) | Charger Cabinet Size |     |     | Remote Transformer |              |   |     |        |
|-------------------------------------|-----------------------|-----------------------------|------|------|-----------------------|-----------|------|------------------------------|----------------------|-----|-----|--------------------|--------------|---|-----|--------|
|                                     |                       | 208                         | 240  | 480  |                       | Btu       | KW   |                              | H                    | W   | D   | KVA >=             | Cabinet Size |   |     | Weight |
|                                     |                       |                             |      |      |                       |           |      |                              |                      |     |     | H                  | W            | D | Lbs |        |
| ARR-M02425F                         | 25                    | 3.1                         | 2.7  | 1.4  | 143                   | 529       | 0.16 | ARRM400                      | 30"                  | 21" | 15" |                    |              |   |     |        |
| ARR-M02430F                         | 30                    | 3.7                         | 3.2  | 1.6  | 150                   | 623       | 0.18 |                              |                      |     |     |                    |              |   |     |        |
| ARR-M02440F                         | 40                    | 5.0                         | 4.3  | 2.2  | 242                   | 810       | 0.24 |                              |                      |     |     |                    |              |   |     |        |
| ARR-M02450F                         | 50                    | 6.2                         | 5.4  | 2.7  | 287                   | 998       | 0.29 | ARRM500                      | 39"                  | 24" | 20" |                    |              |   |     |        |
| ARR-M02475F                         | 75                    | 9.4                         | 8.1  | 4.0  | 373                   | 1467      | 0.43 |                              |                      |     |     |                    |              |   |     |        |
| ARR-M024100F                        | 100                   | 12.5                        | 10.8 | 5.4  | 430                   | 1936      | 0.57 | ARRM650                      | 51"                  | 24" | 20" |                    |              |   |     |        |
| ARR-M024125F                        | 125                   | 15.6                        | 13.5 | 6.8  | 441                   | 2406      | 0.7  |                              |                      |     |     |                    |              |   |     |        |
| ARR-M024150F                        | 150                   | 18.7                        | 16.2 | 8.1  | 463                   | 2875      | 0.84 |                              |                      |     |     |                    |              |   |     |        |
| ARR-M024200F                        | 200                   | 24.9                        | 21.6 | 10.8 | 551                   | 3873      | 1.14 |                              |                      |     |     |                    |              |   |     |        |
| ARR-M024250F                        | 250                   | 31.2                        | 27.0 | 13.5 | 617                   | 4811      | 1.41 | ARRM700                      | 60"                  | 36" | 25" |                    |              |   |     |        |
| ARR-M024300F                        | 300                   | 37.4                        | 32.4 | 16.2 | 642                   | 5749      | 1.68 |                              |                      |     |     |                    |              |   |     |        |
| ARR-M024400F                        | 400                   | 49.9                        | 43.2 | 21.6 | 782                   | 7746      | 2.27 |                              |                      |     |     |                    |              |   |     |        |
| ARR-M024500F                        | 500                   | 62.4                        | 54.0 | 27.0 | 807                   | 9622      | 2.82 |                              |                      |     |     |                    |              |   |     |        |

ARR-M 48VDC PRODUCT RATINGS (\*)

| Charger Model (F - Filtered Output) | Output Current (Amps) | Input Volts / Input Current |       |      | Shipping Weight (Lbs) | Heat Loss |      | Charger Enclosure (Standard) | Charger Cabinet Size |     |     | Remote Transformer |              |   |     |        |
|-------------------------------------|-----------------------|-----------------------------|-------|------|-----------------------|-----------|------|------------------------------|----------------------|-----|-----|--------------------|--------------|---|-----|--------|
|                                     |                       | 208                         | 240   | 480  |                       | Btu       | KW   |                              | H                    | W   | D   | KVA >=             | Cabinet Size |   |     | Weight |
|                                     |                       |                             |       |      |                       |           |      |                              |                      |     |     | H                  | W            | D | Lbs |        |
| ARR-M04825F                         | 25                    | 6.2                         | 5.4   | 2.7  | 197                   | 768       | 0.22 | ARRM400                      | 30"                  | 21" | 15" |                    |              |   |     |        |
| ARR-M04830F                         | 30                    | 7.5                         | 6.5   | 3.2  | 288                   | 921       | 0.27 |                              |                      |     |     |                    |              |   |     |        |
| ARR-M04840F                         | 40                    | 10.0                        | 8.6   | 4.3  | 348                   | 1169      | 0.34 | ARRM500                      | 39"                  | 24" | 20" |                    |              |   |     |        |
| ARR-M04850F                         | 50                    | 12.5                        | 10.8  | 5.4  | 380                   | 1476      | 0.43 |                              |                      |     |     |                    |              |   |     |        |
| ARR-M04875F                         | 75                    | 18.8                        | 16.2  | 8.1  | 438                   | 2184      | 0.64 | ARRM650                      | 51"                  | 24" | 20" |                    |              |   |     |        |
| ARR-M048100F                        | 100                   | 24.9                        | 21.6  | 10.8 | 501                   | 2952      | 0.86 |                              |                      |     |     |                    |              |   |     |        |
| ARR-M048125F                        | 125                   | 31.2                        | 27.0  | 13.5 | 517                   | 3719      | 1.09 |                              |                      |     |     |                    |              |   |     |        |
| ARR-M048150F                        | 150                   | 37.4                        | 32.4  | 16.2 | 517                   | 4368      | 1.28 |                              |                      |     |     |                    |              |   |     |        |
| ARR-M048200F                        | 200                   | 49.9                        | 43.2  | 21.6 | 697                   | 5903      | 1.73 |                              |                      |     |     |                    |              |   |     |        |
| ARR-M048250F                        | 250                   | 62.4                        | 54.0  | 27.0 | 747                   | 7438      | 2.18 | ARRM700                      | 60"                  | 36" | 25" |                    |              |   |     |        |
| ARR-M048300F                        | 300                   | 74.8                        | 64.8  | 32.4 | 772                   | 8735      | 2.56 |                              |                      |     |     |                    |              |   |     |        |
| ARR-M048400F                        | 400                   | 99.8                        | 86.5  | 43.2 | 865                   | 11806     | 3.46 |                              |                      |     |     |                    |              |   |     |        |
| ARR-M048500F                        | 500                   | 124.7                       | 108.1 | 54.0 | 1097                  | 14638     | 4.29 |                              |                      |     |     |                    |              |   |     |        |

(\*) - Contact Applications Engineer for information on product ratings not listed

ARR-M 125VDC PRODUCT RATINGS (\*)

| Charger Model (F - Filtered Output) | Output Current (Amps) | Input Volts / Input Current |       |       | Shipping Weight<br>Lbs | Heat Loss |      | Charger Enclosure (Standard) | Charger Cabinet Size |     |     | Remote Transformer |              |     |     |               |   |
|-------------------------------------|-----------------------|-----------------------------|-------|-------|------------------------|-----------|------|------------------------------|----------------------|-----|-----|--------------------|--------------|-----|-----|---------------|---|
|                                     |                       | 208                         | 240   | 480   |                        | Btu       | KW   |                              | H                    | W   | D   | KVA >=             | Cabinet Size |     |     | Weight<br>Lbs |   |
|                                     |                       |                             |       |       |                        |           |      |                              |                      |     |     |                    | H            | W   | D   |               | H |
| ARR-M12525F                         | 25                    | 15.6                        | 13.5  | 6.8   | 366                    | 1484      | 0.44 | ARRM500                      | 39"                  | 24" | 20" | N/A                |              |     |     |               |   |
| ARR-M12530F                         | 30                    | 18.7                        | 16.2  | 8.1   | 388                    | 1817      | 0.53 |                              |                      |     |     | N/A                |              |     |     |               |   |
| ARR-M12540F                         | 40                    | 24.9                        | 21.6  | 10.8  | 426                    | 2423      | 0.71 |                              |                      |     |     | N/A                |              |     |     |               |   |
| ARR-M12550F                         | 50                    | 31.2                        | 27.0  | 13.5  | 467                    | 2969      | 0.87 |                              |                      |     |     | N/A                |              |     |     |               |   |
| ARR-M12575F                         | 75                    | 46.8                        | 40.5  | 20.3  | 622                    | 4453      | 1.3  | ARRM650                      | 51"                  | 24" | 20" | N/A                |              |     |     |               |   |
| ARR-M125100F                        | 100                   | 62.4                        | 54.0  | 27.0  | 647                    | 5937      | 1.74 |                              |                      |     |     | N/A                |              |     |     |               |   |
| ARR-M125125F                        | 125                   | 77.9                        | 67.6  | 33.8  | 730                    | 7541      | 2.21 | ARRM700                      | 60"                  | 36" | 25" | N/A                |              |     |     |               |   |
| ARR-M125150F                        | 150                   | 93.5                        | 81.1  | 40.5  | 780                    | 8906      | 2.61 |                              |                      |     |     | N/A                |              |     |     |               |   |
| ARR-M125200F                        | 200                   | 124.7                       | 108.1 | 54.0  | 1037                   | 11874     | 3.48 |                              |                      |     |     | N/A                |              |     |     |               |   |
| ARR-M125250F                        | 250                   | 155.9                       | 135.1 | 67.6  | 1037                   | 14843     | 4.35 |                              |                      |     |     | 50                 | 36"          | 30" | 20" | 536           |   |
| ARR-M125300F                        | 300                   | 187.1                       | 162.1 | 81.1  | 1415                   | 17811     | 5.22 |                              |                      |     |     | 50                 | 36"          | 30" | 20" | 536           |   |
| ARR-M125400F                        | 400                   | 249.4                       | 216.2 | 108.1 | 1425                   | 23749     | 6.96 |                              |                      |     |     | 75                 | 36"          | 30" | 20" | 729           |   |
| ARR-M125500F                        | 500                   | 311.8                       | 270.2 | 135.1 | 1703                   | 29686     | 8.7  |                              |                      |     |     | 75                 | 36"          | 30" | 20" | 729           |   |

ARR-M 250VDC PRODUCT RATINGS (\*)

| Charger Model (F - Filtered Output) | Output Current (Amps) | Input Volts / Input Current |       |       | Shipping Weight<br>Lbs | Heat Loss |       | Charger Enclosure (Standard) | Charger Cabinet Size |     |     | Remote Transformer |              |     |     |               |   |
|-------------------------------------|-----------------------|-----------------------------|-------|-------|------------------------|-----------|-------|------------------------------|----------------------|-----|-----|--------------------|--------------|-----|-----|---------------|---|
|                                     |                       | 208                         | 240   | 480   |                        | Btu       | KW    |                              | H                    | W   | D   | KVA >=             | Cabinet Size |     |     | Weight<br>Lbs |   |
|                                     |                       |                             |       |       |                        |           |       |                              |                      |     |     |                    | H            | W   | D   |               | H |
| ARR-M25025F                         | 25                    | 31.2                        | 27.0  | 13.5  | 442                    | 2798      | 0.82  | ARRM500                      | 39"                  | 24" | 20" | N/A                |              |     |     |               |   |
| ARR-M25030F                         | 30                    | 37.4                        | 32.4  | 16.2  | 597                    | 3310      | 0.97  |                              |                      |     |     | N/A                |              |     |     |               |   |
| ARR-M25040F                         | 40                    | 49.9                        | 43.2  | 21.6  | 597                    | 4333      | 1.27  | ARRM650                      | 51"                  | 24" | 20" | N/A                |              |     |     |               |   |
| ARR-M25050F                         | 50                    | 62.4                        | 54.0  | 27.0  | 622                    | 5596      | 1.64  |                              |                      |     |     | N/A                |              |     |     |               |   |
| ARR-M25075F                         | 75                    | 93.6                        | 81.1  | 40.5  | 755                    | 8155      | 2.39  | ARRM700                      | 60"                  | 36" | 25" | N/A                |              |     |     |               |   |
| ARR-M250100F                        | 100                   | 124.7                       | 108.1 | 54.0  | 987                    | 10953     | 3.21  |                              |                      |     |     | N/A                |              |     |     |               |   |
| ARR-M250125F                        | 125                   | 155.9                       | 135.1 | 67.6  | 987                    | 13512     | 3.96  |                              |                      |     |     | N/A                |              |     |     |               |   |
| ARR-M250150F                        | 150                   | 187.1                       | 162.1 | 81.1  | 1340                   | 16310     | 4.78  |                              |                      |     |     | N/A                |              |     |     |               |   |
| ARR-M250200F                        | 200                   | 249.4                       | 216.2 | 108.1 | 1400                   | 21667     | 6.35  |                              |                      |     |     | 75                 | 36"          | 30" | 20" | 729           |   |
| ARR-M250250F                        | 250                   | 311.8                       | 270.2 | 135.1 | 1653                   | 27980     | 8.2   |                              |                      |     |     | 75                 | 36"          | 30" | 20" | 729           |   |
| ARR-M250300F                        | 300                   | 374.1                       | 324.2 | 162.1 | 1985                   | 33098     | 9.7   |                              |                      |     |     | 113                | 38"          | 36" | 24" | 924           |   |
| ARR-M250400F                        | 400                   | 498.8                       | 432.3 | 216.2 | 1985                   | 43334     | 12.7  |                              |                      |     |     | 150                | 45"          | 40" | 25" | 1449          |   |
| ARR-M250500F                        | 500                   | 623.6                       | 540.4 | 270.2 | 2410                   | 54765     | 16.05 | 150                          | 45"                  | 40" | 25" | 1449               |              |     |     |               |   |

(\*) - Contact Applications Engineer for information on product ratings not listed

OPTIONAL FEATURES/EQUIPMENT

- High Capacity AC Breaker
- DC Breaker
- Individual Form C Alarm Contacts:
  - Standard configuration for first five alarms (Rectifier Fail, High DC Volts, Low DC Volts, Ground Fault, AC Fail)
  - Contact Applications Engineer for other alarms available
- Remote Battery Sensing
- Input Monitoring
  - AC Voltage Monitoring (Includes High & Low AC Voltage alarm)
  - AC Voltage & Current are displayed via the standard front panel LCD
  - AC Current Monitoring (Includes High AC Current Alarm)
  - AC Voltage & Current are displayed via the standard front panel LCD

- Metering
- Temperature Compensation
- Blocking Diodes
- Load Sharing
- Ground Fault Lamps with Relays & Test Switch
- Drip Top
- Seismic Enclosure design for selected models
- Remote Communications (Modbus/DNP3)
- 12-Pulse Product Design

Note: Other configurations are available; for your unique requirements, please consult Applications Engineer