

## Modular Programmable AC/DC/Loads Power System

- Truly Modular Design
- Digital System and Power Converter Control
- Control up to 95 assets across 8 mainframes with a single controller
- Control multiple AC and DC power supplies and loads in one or more mainframes
- Create “virtual assets” on the fly
- Highest Power Density
- World-wide AC or DC input



ReFlex Power™ is a high density, modular programmable power system providing DC, AC and electronic load assets all under control of a single controller. It provides a reconfigurable, flexible platform ideal for ATE and production test environments where RFP™ can provide programmable stimulus and bias power as well as programmable loads for the device(s) under test.

The EIA 4U high RFP™ Mainframe can hold up to 12 single-slot modules or combinations of single, dual and triple slot wide modules to configure (or reconfigure) the system for the particular requirements at hand. The mainframe can support up to 6 kW of output power.

Up to 8 mainframes, potentially up to 95 modules, can be controlled via a single controller. The controller communicates to the individual modules via a high speed proprietary bus protocol. The RFP™ controller communicates to the host controller via an Ethernet LAN connection designed in compliance with the LAN Extension for Instrumentation (LXI™) standard, assuring interoperability and ease of integration.

### Virtual Output Channels

By using the powerful ReFlex Power capabilities, the modules can be combined via the controller in series or parallel groups, or series / parallel arrays to form new assets, or “virtual outputs.” This can be accomplished “on the fly” within a test program, with no need to shut down and reconfigure modules.

This unique capability greatly extends the operating range of a ReFlex Power System, and establishes a new power stimulus paradigm. Virtual output channels reduce the overall asset count in any particular system, while increasing the range of voltage and currents available for DUT stimulus.

Virtual channels can be set up across mainframes, and multiple virtual channels can reside in a single mainframe or system.

By implementing this functionality in test systems or as part of an overall test strategy, users can reduce both up-front capital costs, as well as long term supply chain, logistics and support costs.

### Available power modules include

Single slot, 330 Watt programmable DC supplies

- 16V, 20.6A
- 65V, 5.1A

Dual slot, 1kW programmable DC supplies

- 33V, 30A
- 50V, 20A
- 50V, 25A
- 120V, 8.3A
- 450V, 2.3A

Triple slot, 875 VA, single phase, programmable AC supply

- Dual range: 280V AC, 3.5A AC
- Dual Range: 140V AC, 7A AC

Triple slot, 500V, programmable electronic DC loads

- 375 Watt, 500V, 15A
- 375 Watt, 500V, 30A



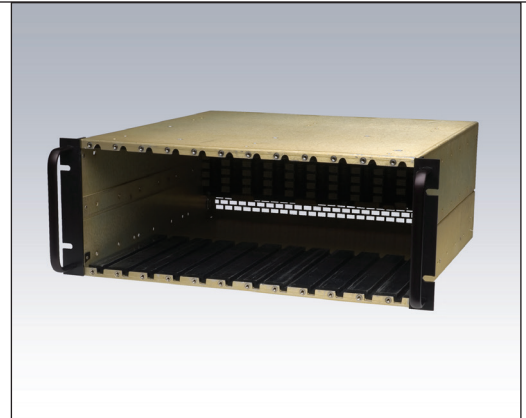
Universal AC/DC



# Elgar ReFlex Power™ Series

## Universal 12 Slot Mainframe

- Worldwide input voltage capability
  - 270 VDC input with relay control
- Input power and connectors for system expansion
- Fully configurable
- No active components
- Power output up to 3600W / 6000W



The ReFlex Power System™ Mainframe consists of 12 fixed pitch “slots” for insertion of AC, DC or Active load modules and the Controller which are one, two, or three “slots” wide.

Very compact in size, 4RU by 17.00” deep, the mechanical design is ruggedized for harsh environments including mobile applications as well as general-purpose industrial and laboratory rack-mount ATE.

The Mainframe connectors on the rear panel facilitate the connection to the AC mains and provide for extending the system to multiple frames, (up to eight). There are no active components in the mainframe, therefore once installed, would not normally have to be uninstalled. It also accommodates the easy

populating of the user system with the various power assets. The mainframe also contains the proprietary RFP backplane.

Any RFP module can be installed in any slot(s) in the mainframe. There is no Slot 0 designated in the power system for the controller. It can be installed in any location depending on the users desired configuration.

The Mainframe is available in three versions. The basic rack mount version, which installs flush with the front of a cabinet, a version which is set back by 4.0” to allow for cable space at the front of the cabinet, and a version which removes the front panel mounting ears to facilitate installation in portable systems. The setback version includes an optional removable front dress panel.

| Two Slot 1000W / 1250W DC Power Modules |   |
|---|---|
| Mainframe Model Number                  | Description   |
| RFP-M0000-001-0000                      | 12 Slot Mainframe   |
| RFP-M0000-001-1E00                      | 12 Slot Mainframe with 90 ° input connector   |
| RFP-M0000-001-1J00                      | 12 Slot Mainframe with 90 ° input connector. No rack ears                                 |
| RFP-M0000-REC-0000                      | 12 Slot RECESSED Mainframe with front dress panel   |
| RFP-M0000-REC-1E00                      | 12 Slot RECESSED Mainframe with front dress panel and 90 ° input connector.               |
| RFP-M0000-REC-2J00                      | 12 Slot RECESSED Mainframe with front dress panel and 90 ° input connector. No rack ears. |
| RFP-M0000-REC-1K00                      | 12 Slot RECESSED Mainframe with front dress panel   |
| 5609184-01                              | 12 Slot RECESSED Mainframe with DC input relay connector                                  |
| 5380059-01                              | Chassis interconnect cable 36 inches **   |
| 5380059-02                              | Chassis interconnect cable 97 inches **   |
| 5380059-03                              | Chassis interconnect cable 135 inches **  |
| Mainframe Optional Accessories          |   |
| Part Number                             | Description   |
| 5380059-01                              | Chassis Slot Blanking Module  |
|   | AC Power Cords  |
| 5380317-01                              | 2 M unterminated Power Cord w/ mainframe connector mate                                   |
| 5380554-01                              | 2 M unterminated Power Cord for single-phase 125V, 20A connection                         |
| 5380555-01                              | 2 M unterminated Power Cord for single-phase 250V, 20A connection                         |
| 5380556-01                              | 2 M unterminated Power Cord for three-phase 120V/208V, 30A connection                     |
|   | AC Mating Connector Kit   |
| 5380318-01                              | AC Input mainframe connector mate   |

All specifications are subject to change

# Elgar ReFlex Power™ Series

| Common                                   |  |
|--|--|
| Module Interface Backplane               | Slot Positions: 12 slots Multi-module control interface  |
| Configuration Guidelines                 | Up to 8 Chassis may be interconnected. Paralleled AC, DC and Load modules must be in adjacent slots and be like modules AC modules to be configured for multi-phase operation must be in adjacent slots.   |
| Regulatory                               | Certified to UL 61010-1, CSA C22.2 No. 61010.1 and IEC/EN 61010-1. Compliance with EN61326 and FCC 21 CFR, Subpart J CE Mark is to EMC and LVD   |
| Input                                    |  |
| Universal Input                          | AC 1 phase: 115/120/200/208/230V ±10%<br>AC 3 phase: 115/200 or 120/208V ±10% delta and wye<br>AC 3 phase: 230/400V ±10% wye – neutral<br>AC Voltage Range: 103.5V to 253V<br>DC Voltage Range: 210V to 300V (314V for 2 sec.) Power Factor: ≥0.95 |
| Frequency range                          | 47Hz to 63Hz, DC   |
| Input Connector                          | Amphenol, DL3102A24-10P  |
| Mating Connector                         | Amphenol, DL3106A24-10P, Input cable and mating connector kits available   |
| Environmental (Extended range available) |  |
| Operating Temperature                    | -10° C to 50° C  |
| Storage Temperature                      | -40° C to 70 °C  |
| Humidity Range                           | 95%, non-condensating  |
| Altitude                                 | up to 2,000 M  |
| Shock and vibration                      | Class 3 Mil-PRF-28800F   |
| Physical : Module Sizes                  |  |
| Dimensions Single Slot                   | 1.4" (35.6mm) W - 6.75" (171.5mm) H - 15" (381 mm) D   |
| Dimensions Dual Slot                     | 2.8" (71.1) W - 6.75" (171.5mm) H - 15" (381 mm) D   |
| Dimensions Triple Slot                   | 4.2" (106.7mm) W - 6.75" (171.5mm) H - 15" (381 mm) D  |

## Common ReFlex Power Applications

### Rackmount ATE Systems

High power density, a large number of output channels and 16-bit resolution, all under the control of a single Ethernet controller, greatly simplifies ATE system integration. The wide variety of voltage and current combinations and power density, created by up to 12 separately programmable DC channels in a compact 4U system, makes RFP the most compact ATE power system on the market. Combining this with the RFP AC and load channels in the same chassis and under the same controller, RFP can elegantly satisfy your most demanding ATE system power stimulus requirements.

### Product Development

Testing and burn-in of aircraft flight hardware, DC-DC converters, automotive electronics and semiconductor components are just a few applications currently being tested with RFP. From simple DC voltage set points and AC sine waves to complex waveforms and triggers, RFP keeps pace with your product development power stimulus challenges.

### Aerospace Testing

ReFlex Power is ideal for testing all types of flight hardware and aircraft auxiliary systems. AC power modules can be operated in single or three phase mode, and expanded from 875 VA single phase to 2,625VA three phase, or even 5,250 VA. By combining variable frequency AC power signals from 45 to 5,000Hz with DC assets in a single 4U mainframe, most modern avionics power stimulus can be delivered.

### Process Control

Whether you are driving magnets for controlling ion beams for the manufacture of semiconductors or driving a current through electrolyte for precise control of a plating process, RFP is your ideal process control choice. RFP's small footprint with flexible configuration of DC, AC and load modules can solve the most complex process control challenges.

### Research

A research environment presents some of the most demanding requirements on your test instrumentation. RFP's flexible sequencing and triggering supports your research needs. All too often, equipment that meets the needs of your current project does not meet the needs of your next project. RFP with its modular design protects your capital assets. The RFP architecture allows you to change to different DC voltage and current combinations, add AC and load modules and parallel and phase-lock modules. This allows RFP to support all your current and future laboratory needs.

All specifications are subject to change



# Elgar Reflex Power™ System DC Power Modules

1000 W

## Programmable 1000 / 1250W High Power DC Modules

33 - 450 V

2.3 - 30 A

- Near Linear Performance
- Truly Modular
- ≥0.95 PFC
- Digital control loop technology
- High Power Density (3.5 watts/cubic inch)
- “Virtual Assets” by:
  - Series operation
  - Parallel operation
  - Combined operation with loads
- Precision Hardware & Software Triggers
- Simple integration



Universal  
AC/DC



The High Power DC supplies of the ReFlex Power™ (RFP™) system include models rated at 1kW and 1250W. They are part of a modular family of power assets that integrate into the RFP™ Mainframe to provide a wide range of features, functionality, and extensive configurability and adaptability.

The modules can be programmed to operate as standalone assets, or in combinations of parallel, series, and series / parallel groups to extend their voltage, current, and power ratings. System shut down is not required to implement groups and multiple groups can be set up in a single system. This “on the fly” characteristic sets the ReFlex Power™ System apart from competitive products.

The DB-9 connector on the front panel of each module provides variety of hardware interface lines. Included are Direct Fault Interrupt (DFI), Remote Inhibit (RI) and Trigger IN / Trigger OUT signals. Safety, ease of integration and functionality are significantly enhanced by these functions.

The DFI signal can be programmed to provide shutdown of modules in fault groups established by the user.

Used together or individually, these signals can be utilized to improve system performance, increase test through-put, reduce system idle time and assure the highest level of safety for the Device Under Test.

RFP™ system of DC power supplies brings true modularity to DC power assets, and makes possible a high degree of configurability and adaptability through a mainframe-based architecture. The mechanical design is ruggedized for harsh environments, including mobile applications, as well as general-purpose industrial and laboratory rack-mount ATE.

An advanced thermal design features integral, variable speed fans. Cooling performance scales based upon the complement of modules in the Mainframe and their output loading. This feature conserves energy, minimizes audible noise and enhances system reliability.

| Two Slot 1000W / 1250W DC Power Modules |   |                  |
|---|---|------------------|
| 1000W / 1250W Model Number              | Description   | Firmware Version |
| RFP-D2033-030-1G00                      | 33Vdc, 30A, w/ Output Relay                                 | Ver 2 Firmware   |
| RFP-D2033-030-2D00                      | 33Vdc, 30A, w/ Output Relay + Ext'd Operating Temperature   | Ver 2 Firmware   |
| RFP-D2050-020-1G00                      | 50Vdc, 20A, w/ Output Relay                                 | Ver 2 Firmware   |
| RFP-D2050-020-2D00                      | 50Vdc, 20A, w/ Output Relay + Ext'd Operating Temperature   | Ver 2 Firmware   |
| RFP-D2050-025-1G00                      | 50Vdc, 25A, w/ Output Relay                                 | Ver 2 Firmware   |
| RFP-D2050-025-2D00                      | 50Vdc, 25A, w/ Output Relay + Ext'd Operating Temperature   | Ver 2 Firmware   |
| RFP-D2120-8A3-1G00                      | 120Vdc, 8.3A, w/ Output Relay                               | Ver 2 Firmware   |
| RFP-D2120-8A3-2D00                      | 120Vdc, 8.3A, w/ Output Relay + Ext'd Operating Temperature | Ver 2 Firmware   |
| RFP-D2450-2A3-1G00                      | 450Vdc, 2.3A, w/ Output Relay                               | Ver 2 Firmware   |
| RFP-D2450-2A3-2D00                      | 450Vdc, 2.3A, w/ Output Relay + Ext'd Operating Temperature | Ver 2 Firmware   |
| RFP-D2033-030-1G1B                      | 33Vdc, 30A, w/ Output Relay                                 | Ver 3 Firmware   |
| RFP-D2033-030-2D1B                      | 33Vdc, 30A, w/ Output Relay + Ext'd Operating Temperature   | Ver 3 Firmware   |
| RFP-D2050-020-1G1B                      | 50Vdc, 20A, w/ Output Relay                                 | Ver 3 Firmware   |
| RFP-D2050-020-2D1B                      | 50Vdc, 20A, w/ Output Relay + Ext'd Operating Temperature   | Ver 3 Firmware   |
| RFP-D2050-025-1G1B                      | 50Vdc, 25A, w/ Output Relay                                 | Ver 3 Firmware   |
| RFP-D2050-025-2D1B                      | 50Vdc, 25A, w/ Output Relay + Ext'd Operating Temperature   | Ver 3 Firmware   |
| RFP-D2120-8A3-1G1B                      | 120Vdc, 8.3A, w/ Output Relay                               | Ver 3 Firmware   |
| RFP-D2120-8A3-2D1B                      | 120Vdc, 8.3A, w/ Output Relay + Ext'd Operating Temperature | Ver 3 Firmware   |
| RFP-D2450-2A3-1G1B                      | 450Vdc, 2.3A, w/ Output Relay                               | Ver 3 Firmware   |
| RFP-D2450-2A3-2D1B                      | 450Vdc, 2.3A, w/ Output Relay + Ext'd Operating Temperature | Ver 3 Firmware   |

# Elgar ReFlex Power™ Series

## Optional Module Accessories and Output Cables

Ametek offers output load cables for each RFP™ module type. Cables mate directly to the modules and are 3 M long and unterminated. The cables are sized appropriately for the rated module current and include sense leads.

Also available are mating connector kits for each connector type used in the system. A module interlock shorting connector must be installed in order to enable any module. These are provided free of charge, but must be ordered on the purchase order.

### DC Power Module Optional Accessories

| Part Number | Description   |
|-------------|---|
| 5380444-01  | 16Vdc 9 foot output cable   |
| 5380444-03  | 16Vdc 9 foot output cable - 90 degree bend for shorter bend radius            |
| 5380445-01  | 65Vdc 9 foot output cable   |
| 5380445-03  | 65Vdc 9 foot output cable - 90 degree bend for shorter bend radius            |
| 5380446-01  | 33Vdc/50Vdc 9 foot output cable   |
| 5380446-03  | 33Vdc/50Vdc 9 foot output cable - 90 degree bend for shorter bend radius      |
| 5380453-01  | 120Vdc 9 foot output cable  |
| 5380453-03  | 120Vdc 9 foot output cable - 90 degree bend for shorter bend radius           |
| 5380447-01  | 450Vdc 9 foot output cable  |
| 5380447-03  | 450Vdc 9 foot output cable - 90 degree bend for shorter bend radius           |
| 5380443-01  | Module 9-pin D-sub 9 foot cable   |
| 5380443-03  | Module 9-pin D-sub 9 foot cable (90 degree bend)                              |
| 5380508-01  | Module interlock shorting connector (Don't order w/ cable (5380443-xx) above) |
| 5380270-01  | 16Vdc Connector Mating Kit  |
| 5380270-02  | 65Vdc Connector Mating Kit  |
| 5380271-01  | 33Vdc/50Vdc Connector Mating Kit  |
| 5380271-03  | 120 Vdc Connector Mating Kit  |
| 5380271-02  | 450Vdc Connector Mating Kit   |

### AC Power Module Optional Accessories

| Part Number | Description   |
|-------------|---|
| 5380450-01  | AC 9 foot output cable  |
| 5380450-03  | AC 9 foot output cable - 90 degree bend for shorter bend radius               |
| 5380443-01  | Module 9-pin D-sub 9 foot cable   |
| 5380443-03  | Module 9-pin D-sub 9 foot cable (90 degree bend)                              |
| 5380508-01  | Module interlock shorting connector (Don't order w/ cable (5380443-xx) above) |
| 5380272-01  | AC Output Connector Mating Kit  |

### Active Load Module Optional Accessories

| Part Number | Description   |
|-------------|---|
| 5380452-01  | DC Loads 9 foot output cable  |
| 5380443-01  | Module 9-pin D-sub 9 foot cable   |
| 5380443-03  | Module 9-pin D-sub 9 foot cable (90 degree bend)                              |
| 5380508-01  | Module interlock shorting connector (Don't order w/ cable (5380443-xx) above) |
| 5380273-01  | DC Load Connector Mating Kit  |
| 5380272-01  | AC Output Connector Mating Kit  |

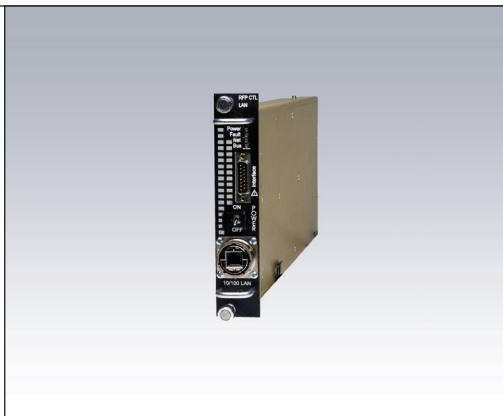
# Elgar Reflex Power™ System DC Power Modules

330 W

## Programmable 300W Low Power DC Modules

16 - 65 V

- Near Linear Performance
- Truly Modular
- $\geq 0.95$  PFC
- Digital control loop technology
- High Power Density (3.5 watts/cubic inch)
- "Virtual Assets" by:
  - Series operation
  - Parallel operation
  - Combined operation with loads
- Precision Hardware & Software Triggers
- Simple integration



5.1 - 20.6 A



Universal  
AC/DC



The Low Power DC supplies of the ReFlex Power™ (RFP™) system are rated at 330W, They are part of a modular family of power assets that integrate into the RFP™ Mainframe to provide a wide range of features, functionality, and extensive configurability and adaptability.

The modules can be programmed to operate as standalone assets, or in combinations of parallel, series, and series / parallel groups to extend their voltage, current, and power ratings.

The DB-9 connector on the front panel of each module provides variety of hardware interface lines. Included are Direct Fault Interrupt (DFI), Remote Inhibit (RI) and Trigger IN / Trigger OUT signals. Safety, ease of integration and functionality are significantly enhanced by these functions.

The DFI signal can be programmed to provide shutdown of modules in fault groups established by the user.

Used together or individually, these signals can be utilized to improve system performance, increase test through-put, reduce system idle time and assure the highest level of safety for the Device Under Test.

RFP™ system of DC power supplies brings true modularity to DC power assets, and makes possible a high degree of configurability and adaptability through a mainframe-based architecture. The mechanical design is ruggedized for harsh environments, including mobile applications, as well as general-purpose industrial and laboratory rack-mount ATE.

An advanced thermal design features integral, variable speed fans. Cooling performance scales based upon the complement of modules in the Mainframe and their output loading. This feature conserves energy, minimizes audible noise and enhances system reliability.

| Single Slot 300W DC Power Modules |   |                  |
|-----------------------------------|---|------------------|
| 300W Model Number                 | Description   | Firmware Version |
| RFP-D1016-021-1G00                | 16Vdc, 20.6A, w/ Output Relay                               | Ver 2 Firmware   |
| RFP-D1016-021-2D00                | 16Vdc, 20.6A, w/ Output Relay + Ext'd Operating Temperature | Ver 2 Firmware   |
| RFP-D1065-5A1-1G00                | 65Vdc, 5.1A, w/ Output Relay                                | Ver 2 Firmware   |
| RFP-D1065-5A1-2D00                | 65Vdc, 5.1A, w/ Output Relay + Ext'd Operating Temperature  | Ver 2 Firmware   |
| RFP-D1016-021-1G1B                | 16Vdc, 20.6A, w/ Output Relay                               | Ver 3 Firmware   |
| RFP-D1016-021-2D1B                | 16Vdc, 20.6A, w/ Output Relay + Ext'd Operating Temperature | Ver 3 Firmware   |
| RFP-D1065-5A1-1G1B                | 65Vdc, 5.1A, w/ Output Relay                                | Ver 3 Firmware   |
| RFP-D1065-5A1-2D1B                | 65Vdc, 5.1A, w/ Output Relay + Ext'd Operating Temperature  | Ver 3 Firmware   |



# ReFlex Power™ DC Power Modules : Specifications

| DC Modules General Specifications |   |
|-----------------------------------|---|
| Regulation                        |   |
| Steady State, Voltage Mode        | 0.01% of full-scale + 10mV (330W) and 0.03% of full-scale (1/1.2kW) for 10% line or 100% load change  |
| Steady State, Current Mode        | 0.05% of full scale (330W) and 0.1% of full-scale (1/1.2 kW) for 10% line change. Less than 0.1% of full-scale for 100% load change   |
| Load Transient                    | <5% of full scale maximum excursion returning to steady state value within 0.5% of full scale in 2 ms maximum, for 90% load step above and below 50% nominal load.  |
| Remote Sense                      | Up to 3V total load line drop. The drop in the load leads subtracts from the maximum voltage available for the load.  |
| Parallel Operation                | Up to six like modules.   |
| Series Operation                  | Up to five like modules for 16V, 65V; Up to three like models for 33V, 50V, 120V, Float not to exceed 200V (16V, 33V, 50V, 120V), 300V (65V), 450V (450V).<br>Note: 120V and 450V cannot be placed in series.                       |
| Sag/Surge/Hold Up Time            | Sag to 65% of nominal for 450ms at full output power with AC input at $\geq 200VAC$ . Surge to 135% of nominal for 450ms at full output with AC input $\leq 230VAC$ . 10ms hold up at loss of input: 8ms hold up for 50V above 20A. |
| Remote programming connector      | 9-pin D-sub miniature   |
| Power Output Connector            | Combination signal/power contact subminiature D (Output cables and Mating Connector kits available)   |
| Trigger Latency                   | 5 micro-seconds typical.  |

| DC Low Power                      |                 |                |
|-----------------------------------|-----------------|----------------|
| Output Voltage                    | 0-16V           | 0-65V          |
| Maximum Output Current            | 20.6A           | 5.1A           |
| Maximum Power                     | 330W            | 330W           |
| Output rise/fall time             | 20msec          | 20msec         |
| Mainframe Slots                   | 1               | 1              |
| Ripple / Noise                    |                 |                |
| RMS ( 20 Hz - 300 kHz )           | 5mV             | 6mV            |
| Peak-Peak ( 20 Hz - 20 MHz)       | 25mV            | 18mV           |
| Programming Accuracy              |                 |                |
| Voltage (0.05% of setpoint + ...) | 10mV            | 32.5mV         |
| Current (0.1% of setpoint + ...)  | 21mA            | 5.1mA          |
| Resolution                        | 0.47 mV/1.28 mA | 1.9 mV/0.32 mA |
| Temperature Coefficient           |                 |                |
| Voltage /°C                       | 1.6mV           | 6.5mV          |
| Current /°C                       | 5mA             | 1mA            |

| DC High Power                     |             |             |             |             |               |
|-----------------------------------|-------------|-------------|-------------|-------------|---------------|
| Output Voltage                    | 0-33V       | 0-50V       | 0-50V       | 0-120V      | 0-450V        |
| Maximum Output Current            | 30A         | 20A         | 25A*        | 8.3A        | 2.3A          |
| Maximum Power                     | 990W        | 1000W       | 1250W*      | 996W        | 1035W         |
| Output rise/fall time             | 20msec      | 20msec      | 20msec      | 20msec      | 20msec        |
| Mainframe Slots                   | 2           | 2           | 2           | 2           | 2             |
| Ripple / Noise                    |             |             |             |             |               |
| RMS ( 20 Hz - 300 MHz )           | 15mV        | 20mV        | 20mV        | 20mV        | 40mV          |
| Peak-Peak ( 20 Hz - 20 MHz )      | 60mV        | 75mV        | 75mV        | 75mV        | 200mV         |
| Programming Accuracy              |             |             |             |             |               |
| Voltage (0.05% of setpoint + ...) | 16.5mV      | 25mV        | 25mV        | 60mV        | 225mV         |
| Current (0.2% of setpoint + ...)  | 30mA        | 20mA        | 25mA        | 10mA        | 2.3mA         |
| Resolution                        | 2 mV/1.9 mA | 3 mV/1.3 mA | 3 mV/1.6 mA | 7 mV/0.6 mA | 28 mV/0.14 mA |
| Temperature Coefficient           |             |             |             |             |               |
| Voltage /°C                       | 3.3mV       | 5mV         | 5mV         | 12mV        | 45mV          |
| Current /°C                       | 9mA         | 6mA         | 7.5mA       | 2.5mA       | 0.7mA         |

\* 1250 Watt module must have an AC Input voltage above 188 VAC or DC input above 210 VDC. The Module will not operate below the required input line voltage.

All specifications are subject to change



# Elgar ReFlex Power™ AC Power Modules

875 VA

## High Density Programmable AC Power Modules

140–280 VAC

- Single or multi-phase output
- Parallel operation up to 5250 VA, 3 phase
- 4.8 Crest factor
- Digital control loop technology
- Brown out protection to 65% of nominal input line
- Up to 875 VA
- 45 to 1200 Hz or 5000 Hz



3.5–7 Arms



Universal  
AC/DC



The ReFlex Power™ (RFP™) system includes an AC power source rated at 875VA with two output voltage ranges, 0-140VAC and 0-280VAC.

This AC source module is part of a modular family of power assets that integrate into the RFP™ Mainframe to provide a wide range of features, functionality and extensive configurability and adaptability.

The AC module can be set up to operate as a standalone asset, in combinations of parallel or in multi-phase groups to extend their voltage, current, and power rating.

The DB-9 connector on the front panel of each module provides Remote Inhibit (RI). This allows the user to turn on / off individual modules with a hardware interface. This function enhances safety and ease of integration.

The RFP AC Power module provides a very robust output, with surge rating of 140% (5A / 7A or 7A / 10A) and a crest factor rating of 4.8:1.

Two frequency options are available to satisfy most avionics, commercial and industrial test requirements; 45Hz to 1200Hz or 45 to 5000Hz. The module utilizes high-frequency power conversion for high efficiency to maximize power density and realize lightweight and small size.

Weighing only 11.4 lb., a three phase 2625 VA power system weighs only 50lbs. and can be expanded to 5250 total VA in only 8U of rack elevation.

An advanced thermal design features integral, variable speed fans. Cooling performance scales based upon the complement of modules in the Mainframe and their output loading. This feature conserves energy, minimizes audible noise and enhances system reliability.

### Three Slot 875VA AC Power Modules

| AC Model Number    | Description   | Firmware Version |
|--------------------|---|------------------|
| RFP-A301K-875-1G00 | 875VA, 45-1.2 kHz w/ Output Relay                               | Ver 2 Firmware   |
| RFP-A301K-875-2D00 | 875VA, 45-1.2 kHz w/ Output Relay + Ext'd Operating Temperature | Ver 2 Firmware   |
| RFP-A305K-875-1G00 | 875VA, 45-5.0 kHz w/ Output Relay                               | Ver 2 Firmware   |
| RFP-A305K-875-2D00 | 875VA, 45-5.0 kHz w/ Output Relay + Ext'd Operating Temperature | Ver 2 Firmware   |
| RFP-A301K-875-1G1B | 875VA, 45-1.2 kHz w/ Output Relay                               | Ver 3 Firmware   |
| RFP-A301K-875-2D1B | 875VA, 45-1.2 kHz w/ Output Relay + Ext'd Operating Temperature | Ver 3 Firmware   |
| RFP-A305K-875-1G1B | 875VA, 45-5.0 kHz w/ Output Relay                               | Ver 3 Firmware   |
| RFP-A305K-875-2D1B | 875VA, 45-5.0 kHz w/ Output Relay + Ext'd Operating Temperature | Ver 3 Firmware   |

# ReFlex Power™ AC Power Modules : Specifications

| AC Modules General Specifications   |   |
|-------------------------------------|---|
| Continuous Current                  | 7A, maximum for 0-140VAC range, 3.5A, maximum for 0-280VAC range.   |
| Surge Current                       | 10A, maximum for 0-140VAC range up to 125VAC, derated linearly to 8.93A at 140VAC; 5A, maximum for 0-280VAC range up to 250VAC, derated linearly to 4.46 at 280VAC, time duration of 0.5s, maximum.   |
| Frequency                           | 45-1200 Hz, up to 5 kHz optional  |
| Crest Factor                        | 4.8 X FS rms current  |
| Voltage Regulation, Line & Load     | Voltage mode 0.1% of full scale. 100% resistive load change or 10% line change from nominal.  |
| Programming Accuracy                | Voltage $\pm(0.1\% + .2\%/kHz)$ of full scale from 0.25% to 102% of range;<br>Current $\pm(0.5\% + 0.75\%/kHz)$ of full scale from 2% to 102% of range;<br>Frequency $(0.01\% + 0.01\%/kHz)$ of setpoint  |
| Programming Resolution              | Voltage 0-140VAC 20mV, 0-280 40mV<br>Current 5mA<br>Frequency 0.1Hz thru 1kHz; 0.5Hz thru 5KHz  |
| Temperature Drift                   | Voltage .05% of full scale per °C<br>Current .05% of full scale per °C  |
| Voltage Distortion (Resistive Load) | <1% to 500Hz<br><2% to 2kHz<br><5% to 5kHz  |
| Output DC Offset                    | 0.1VDC maximum  |
| Efficiency                          | (72% - 1.4%/kHz) at full output power and 115VAC input, and no load on auxiliary output, typical  |
| Noise                               | 55dB below full scale, typical; RMS value measured with output at 50Hz and with a bandwidth from 10kHz to 20MHz   |
| Hold-up time                        | Dropout of AC input to zero for 10ms at full output power   |
| Remote Sense                        | 0.75Vrms per load line  |
| Overvoltage Protection              | Range: 1.4% to 110% Accuracy: 2% of setpoint  |
| Overcurrent Protection              | Range: 0.4% to 106% Accuracy: 3% of setpoint  |
| Auxiliary AC Output                 | Isolated, 0Vac to 31.6Vac, 2A max, tracks main output (140 VAC range) at 22.6% of output from 350Hz - 1kHz  |
| Cooling                             | required at full load & max temperature. 40CFM airflow at altitude and ambient temperature  |
| Parallel Operation                  | Up to 6 Modules (must be located contiguously in mainframe.)  |
| Multi-phase Operation               | Up to 6 Delta and wye loads are supported. Modules must be configured as wye sources (neutrals connected).  |
| Phase Programming Range             | 0-360 degree; with respect to A-phase; any module could be an A-Phase (the master); adjacent modules to the right of A-Phase would be B-Phase and C-Phase; counterclockwise phasor rotation is assumed, therefore the phase angle offset is lagging the master reference. |
| Phase Programming Accuracy          | 1 degree plus 1°/kHz for balanced resistive load measured with respect to A-phase   |
| Remote programming connector        | 9-pin D-sub miniature   |
| Output connector                    | Combination signal/power contact subminiature D (Out cables and mating connector kits available)  |

All specifications are subject to change

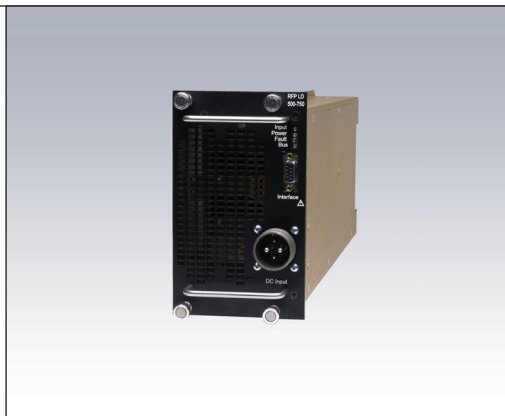
# Elgar ReFlex Power™ Active Load Modules

375–750 W

## High Density Programmable Active Load Modules

500 V

- High Voltage (500V) Input
- Digital control loop technology
- Two models: 375 W & 750 W
- Up to 15 A or 30 A
- Parallel up to 8 automatically
- Modular
- High Power Density
- Simple integration



15–30 A



Universal  
AC/DC

**LXI** ETHERNET

The High Power Active Load (HPAL) and the Low Power Active Load (LPAL) of the ReFlex Power™ (RFP™) system include models rated at 750 W and 350 W. They are part of a modular family of power assets that integrate into the RFP™ Mainframe to provide a wide range of features, functionality, and extensive configurability and adaptability.

The 500V provide an exceptional range of operation. They can be set up to operate as standalone assets, or in combinations of parallel groups to extend their current, and power ratings up to as high as 180 A and nearly 4000W in a single mainframe.

The DB-9 connector on the front panel of each module provides Remote Inhibit (RI). This allows the user to turn on / off individual modules with a hardware interface. This function enhances safety and ease of integration. Remote analog programming is also available, allowing the user to modulate the load with a hardware line.

The modules utilize FET active current sinks in modular form to get the flexibility of the two power ranges. The 375 W module is housed in a triple-width enclosure, and weighs 8.2 lb. The 750 W module is also triple-width, and weighs 12.9 lb.

Two modes of operation are available. Current mode up to 30A and resistive mode, programmable 0 to 5000 ohms in three ranges. In addition, each Active Load can be controlled independently with an analog signal to control or modulate the output with an external signal.

An advanced thermal design features integral, variable speed fans. Cooling performance scales based upon the complement of modules in the Mainframe and their output loading. This feature conserves energy, minimizes audible noise and enhances system reliability.

### Three Slot 500V, 15A or 30A Active Load Modules

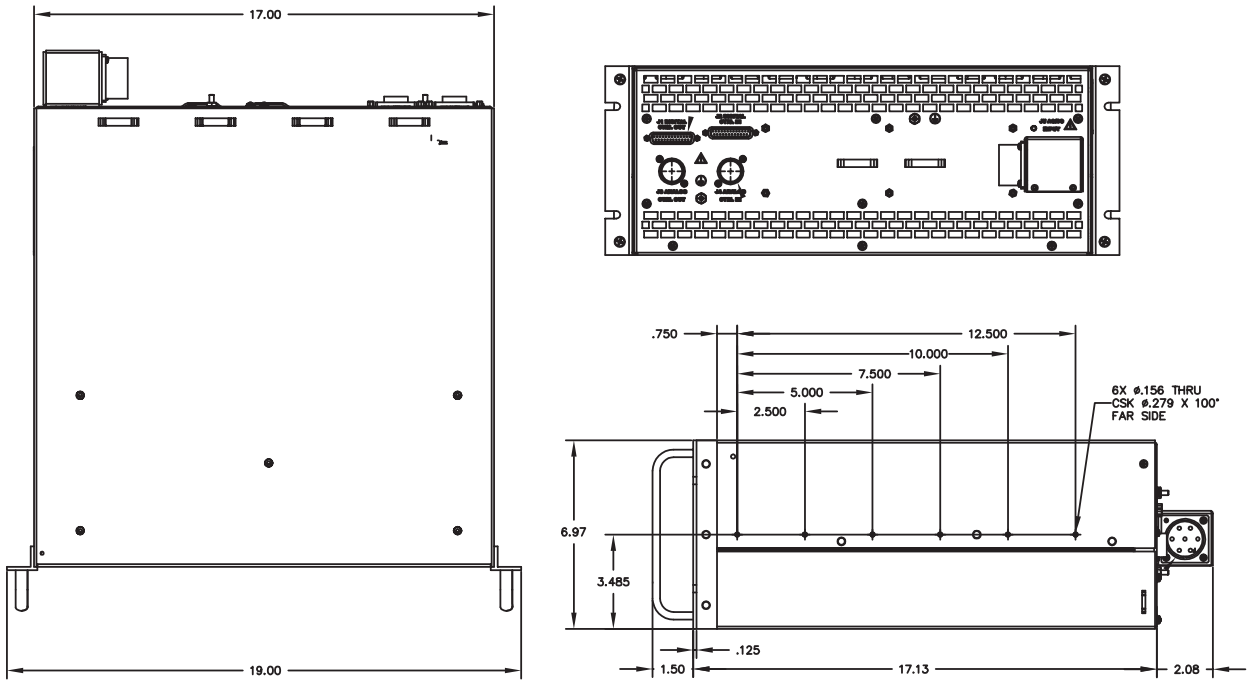
| Active Load Model Number | Description   | Firmware Version |
|--------------------------|---|------------------|
| RFP-D3500-375-1G00       | 500Vdc, 15A w/ Output Relay                               | Ver 2 Firmware   |
| RFP-D3500-375-2D00       | 500Vdc, 15A w/ Output Relay + Ext'd Operating Temperature | Ver 2 Firmware   |
| RFP-D3500-750-1G00       | 500Vdc, 30A w/ Output Relay                               | Ver 2 Firmware   |
| RFP-D3500-750-2D00       | 500Vdc, 30A w/ Output Relay + Ext'd Operating Temperature | Ver 2 Firmware   |
| RFP-D3500-375-1G1B       | 500Vdc, 15A w/ Output Relay                               | Ver 3 Firmware   |
| RFP-D3500-375-2D1B       | 500Vdc, 15A w/ Output Relay + Ext'd Operating Temperature | Ver 3 Firmware   |
| RFP-D3500-750-1G1B       | 500Vdc, 30A w/ Output Relay                               | Ver 3 Firmware   |
| RFP-D3500-750-2D1B       | 500Vdc, 30A w/ Output Relay + Ext'd Operating Temperature | Ver 3 Firmware   |

# ReFlex Power™ Active Load Modules : Specifications

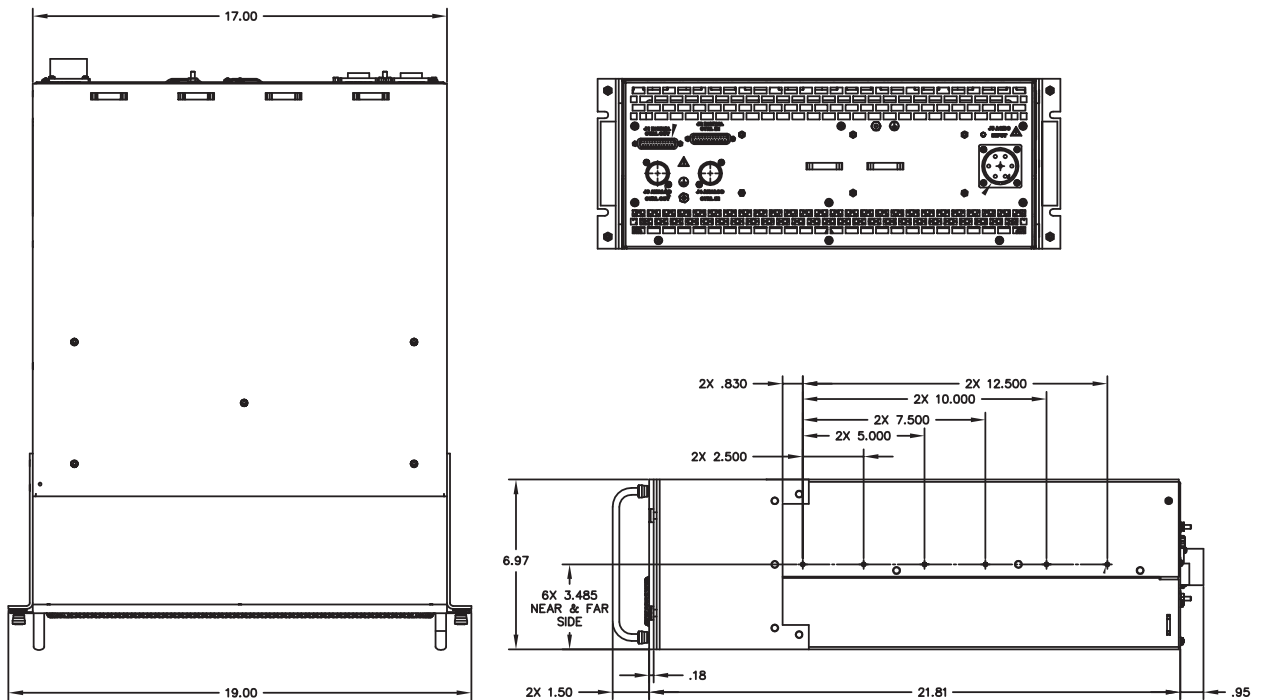
| DC Loads Modules General Specifications |  |   |
|---|--|---|
| Physical                                | Size: 3 RFP Slots, Weight 8.2 lbs (375W); 12.9 lbs (750W)  |   |
| Connectors                              | DC Input and Sense: MS3106F-20-24S Remote Programming: 9 pin D-Sub (Output cables and mating connector available)  |   |
| Current Stability                       | <0.1% of full scale after 8 hrs  |   |
| Current Temperature Drift               | <0.05% of full scale/°C  |   |
| Protection                              | Overvoltage: 525V ± 3%, Overcurrent: 20A ± 3% (375W), 40A ± 3% (750W)<br>Overpower: 19-394W ± 5% (375W), 38 – 788W ± 5% (750W), Reverse Voltage: -15V ± 1V |   |
| Parallel Operation                      | Up to 8 modules.   |   |
| Noise                                   | 30mA (pk-pk) (375W), 90mA (pk-pk)(750W), 20 Hz to 20 MHz bandwidth   |   |
| Programming Response Time               | 55ms   |   |
| Dynamic Response (10 - 90%/90 to 10%)   | 50µs   |   |
| Remote Sense                            | 0.75V per source line  |   |
| Max Float Voltage                       | 500VDC any input terminal to chassis   |   |
| Cooling                                 | Internal fans, require 110 CFM minimum airflow with full power and at maximum altitude and ambient temperature   |   |
| All specifications                      | 25°±5°C.   |   |
| Digital Voltage Measurement             |  |   |
| Range                                   | 0-500V   |   |
| Resolution                              | 33mV   |   |
| Accuracy                                | 0.1% of FS   |   |
| Digital Current Measurement             | 375W   | 750W                                    |
| Range                                   | 0-15A  | 0-30A                                   |
| Resolution                              | 1.0mA  | 2.0mA                                   |
| Accuracy                                | 0.3% of full scale   | 0.3% of full scale                      |
| Current Mode                            | 375W   | 750W                                    |
| Range                                   | 0-15A  | 0-30A                                   |
| Resolution                              | 1.0mA  | 2.0mA                                   |
| Digital Programming Accuracy            | 0.3% of full scale   | 0.3% of full scale                      |
| Regulation                              | 0.1% of full scale for 100% load change  | 0.1% of full scale for 100% load change |
| Resistance Mode                         |  |   |
| Range 1, Resolution                     | 1-99Ω, 1Ω resolution with Current ≥ 1% of FS   |   |
| Range 2, Resolution                     | 100-1000Ω, 100Ω full scale resolution with Current ≥ 1% of FS  |   |
| Range 3, Resolution                     | 1000-5000Ω, 1000Ω full scale resolution with Current ≥ 1% of FS  |   |
| Digital Programming Accuracy            | 5% of setpoint. full scale with Current ≥ 10% of FS  |   |
| Load Transient                          | 60 msec to set point   |   |
| Analog Control (Current Mode)           |  |   |
| Range                                   | 0 to 10V = zero to full scale  |   |
| Accuracy                                | 0.3% of full scale + digital accuracy  |   |
| Bandwidth                               | 8kHz @ -3dB  |   |
| DC Input Ratings                        | 375W   | 750W                                    |
| Voltage                                 | 500V   | 500V                                    |
| Current                                 | 15A  | 30A                                     |
| Power                                   | 375W   | 750W                                    |
| Min Voltage, Full Load                  | 3V   | 3V                                      |

All specifications are subject to change

# Elgar ReFlex Power™ Diagram

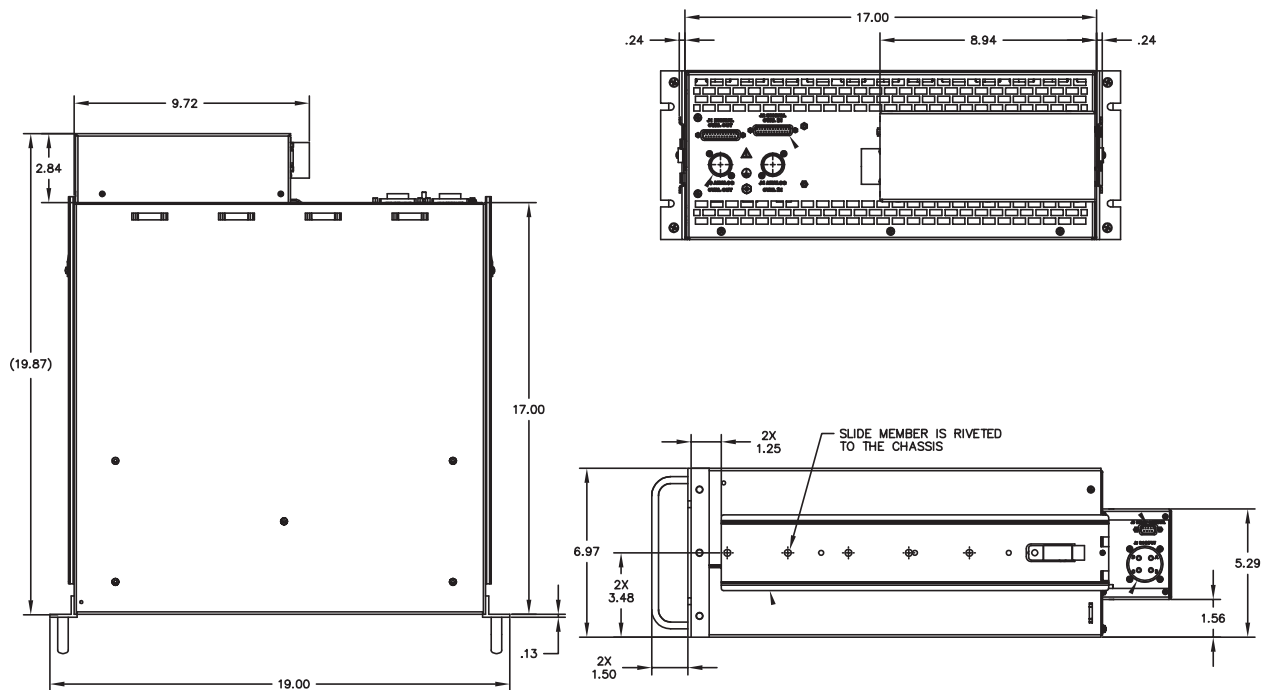


Standard Chassis with 90 degree connector shown



Recessed Chassis with straight connector shown

# Elgar ReFlex Power™ Diagram



5609184-01 Chassis (DC input with contactor and 90 degree input connector)



## 绿测科技有限公司

广州总部：广州市番禺区陈边村金欧大道83号江潮创意园A栋208室  
 深圳分公司：深圳市龙华区龙华街道 油松社区东环一路1号耀丰通工业园1-2栋2栋607  
 南宁分公司：广西自由贸易试验区南宁片区五象大道401号五象航洋城1号楼3519号  
 广州分公司：广州市南沙区凤凰大道89号中国铁建·凤凰广场B栋1201房  
 电话：020-2204 2442  
 传真：020-8067 2851  
 邮箱：Sales@greentest.com.cn  
 官网：www.greentest.com.cn



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