



RECTIFIERS

Switchmode Technology



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Switchmode Cathodic Protection Rectifiers



SMR FRONT VIEW WITH DOOR



SMR SIDE VIEW WITH DOOR

Switchmode rectifiers are known for their quality, efficiency, service life and workmanship. Switchmode rectifiers have been used for many years and this demonstrates its quality service that it provides and also offers many extra features that can be installed in order to fit the specific Cathodic Protection needs. The switchmode rectifier is a newer technology and is significantly more advanced than transformer rectifiers utilizing high frequency switching devices resulting in far greater feedback responsiveness, efficiency and service life.

Switchmode Cathodic Protection rectifiers can typically be used with corrosion protection systems on pipelines, tank farms and other vulnerable metal structures, that are at risk to corrosion, where impressed DC currents are required.

Benefits and Features of Switchmode Rectifiers

Benefits of Switchmode Cathodic Protection Rectifiers

- Integrated Remote Monitoring option (No need for other 3rd Party)
- Automatic with 4 modes of control
- Can be used in all CP applications
- Increased efficiency of output, up to 95% compared to inefficient Transformers
- Increased efficiency means less heat production and is thermodynamically more stable for warm environment applications
- Smaller and lighter than typical Transformer Rectifier Counterpart
- Smaller & Lighter equals lower shipping costs
- Go green with lower carbon footprint & Solar options
- High Quality DC output improve CP Spread
- Lower AC Power consumption
- Less copper to reduce cost, weight & theft



Features of Switchmode Cathodic Protection Rectifiers

- 4 modes of Automatic PID output feedback control (Constant voltage , constant current, constant reference potential and iterative instant off)
- Heavy duty power factor correction rectification
- Single phase wide range voltage input 90– 260 VAC
- Input frequency range 47– 63 Hz
- High frequency switching for maximum efficiency of up to 95%
- Digital metering with backlight for voltage, current and reference potential
- C–curve input circuit breaker for inrush protection and DC output fuses for current fault protection
- DC fuse status, AC circuit breaker, phase failure indication LEDs
- High resolution control, 1% accuracy feedback variables measurement
- DC Output ripple voltage 150 mVAC
- Hour counter for when rectifier output is less than 100mA
- 5 Input digital I/O card for custom alarms and telemetry
- Forced air cooling by DC ball bearing fan
- The output shut off protection with automatic recovery for overload, over voltage and over temperature
- Rectifier operating temperatures –4 to 122°F/ (-20 to 70°C)
- Terminal blocks for AC input wires, monitor, reference and coupon

- 1000 V insulated, temperature resistant flexible multi strand wiring
- Coupon interrupt facility for defect potential measurement
- Bussbar connection for Anodes and structure
- Input lightning protection Class II 40kA (8/20µs)
- Output lightning protection Class I 100kA (10/350µs)
- Monitor/ reference Signal surge protection
- 115 VAC convenience mains outlet
- Stainless steel Grade 3CR12 (UNS S40977) Cabinet, Powder coated cabinet finishes (grey standard) with IP 65 ingress protection
- Inner door separating hazardous components with metering, measuring and controlling components. The inner door is accessible so that change of setting and socket measurement can be done easily as well as data logging
- Dead front door

Switchmode Selection

Switchmode designs are according to power ratings. We have 5 standard switchmode power ratings: 150W, 300W, 750W, 1500W, and 3000W. Within these power ratings, switchmodes have 4 different maximum output voltages: 12V, 24V, 48V and 60V. Their maximum current varies accordingly.

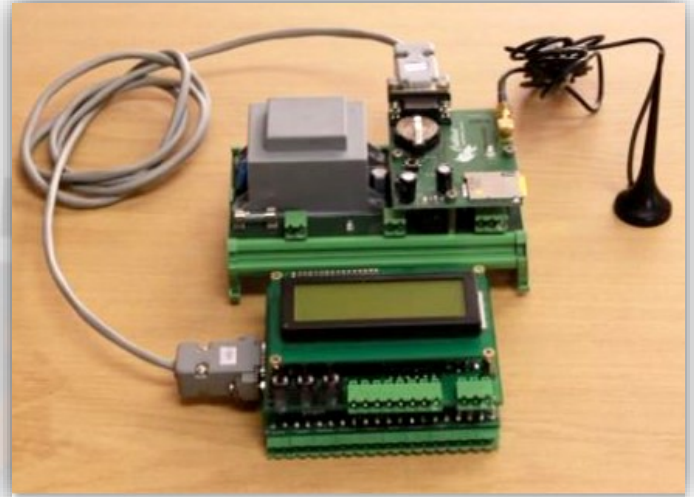
Use the table provided below to select your switchmode rating.

Option	DC Voltage	Output Amp	Watt
Rectifier, 24V, 6.25A, 150W 701410	24V	6.25A	150W
Rectifier, 12V, 25A, 300W 701220	12V	25A	300W
Rectifier, 24V, 12.5A, 300W 701420	24V	12.5A	300W
Rectifier, 24V, 32A, 768W 701430	24V	32A	768W
Rectifier, 48V, 32A, 1536W 701830	48V	32A	1536W
Rectifier, 60V, 50A, 3000W 701XXX	60V	50A	3000W

Additional Options

- Remote Monitoring Unit (RMU) Module

Optional GSM Modem using RS232 for telemetry. Modem can send instantaneous values of output voltage, current and reference potential measurement, 24 hour period logged values, 8 bit user defined alarms including phase failure, circuit breaker and fuse rupture. Modem can also relay present control mode and has the ability to change control mode, set up parameters and boundary values. This requires a registered sim card.



- Manual Control

This is a feature where the user can switch over from automatic control to manual output voltage using a potentiometer style knob accessible from the inner door.

- Current Sharing

Switchmodes can be arranged in parallel in current sharing mode for special high power applications.

- Replacement Parts

Lightning equipment, fuses, LEDs, metering equipment, electronic PC boards, electrical components etc.

*For other options please contact us.



Switchmode Enclosure Details

Our Standard enclosures are made from a grade of stainless steel called 3CR12 (also designated as UNS S40977/ S41003 or 1,4003) This material is chromium fabricated by modifying the properties of grade 409 steel. It is resistive to mild corrosion, wet abrasion and it is easy to weld and punch.

Switchmodes come in 1 standard enclosure sizes depending on the power output. The enclosures are 0.063 inches thick with an orange powder coated finish. Ingression is IP 65.



Standard Dimensions		
A	B	C
27.5 in.	23.5 in.	11.0 in.
700 mm	600 mm	270 mm

*Under special request, we can modify or customize cabinets suited to the client.

- Enclosure 304 Stainless steel. Mild steel and Polycarbonate enclosures can be requested
- Weather proof according to IP or NEMA 4 ratings– IP 54, IP 55, IP 65, IP 66, IP 68
- Standard Colors to select from (Orange, Gray, Green, White. Other options are available.)



Enclosure Optional Extras

Enclosures can be ordered with a Canopy for outdoor applications in direct sunlight, louvers for ventilation, a plinth for floor mounting or a glass door for viewing control values and settings.

Typical Thermodynamics

Switchmodes, at their optimum efficiency, perform well in small enclosures within ambient temperatures of up to 158°F (70°C). A heat run was conducted in an enclosure with no ventilation at full load and over a period of 11 hours. The inside enclosure temperature was recorded against the ambient temperature at a sampling rate of every 10 seconds.

Starting the heat run at an ambient temperature of 50°F (10°C), the enclosure temperature exponentially increases with time due to its rate of heat dissipation. The rate of heat dissipation tends to a constant temperature value over 10 hours, this maximum cabinet temperature is 122°F (50°C) and is uniform throughout the switchmode enclosure. After 10 hours the ambient temperature decreases and then the enclosure temperature decreases accordingly as a result. The thermodynamics of the enclosure is internally stable and is now being influenced only by external variables.

