PHALCON® - 2000 RACON
ZONE 1

Pharos Marine Automatic Power

RACONS are important all-weather aids to navigation, which provide radar range and bearing information for safe and efficient navigation 24 hours a day. The Phalcon-2000 is a fourth generation racon, using solid-state microwave electronics designed to comply with all IALA/IMO recommendations. It is frequency agile in both X and S Marine Radar bands. The Phalcon-2000 is energy efficient, compact and lightweight racon designed for superior performance on unstable platforms such as buoys, TLPs, and FPSOs in adverse weather conditions.

Pharos Marine has taken the IP 67 rated Phalcon-2000 Racon and has adapted it with an inert gas pressurization system for Zone 1 applications. This allows both X and S bands in an Ex pedm rated unit.

At the heart of the Phalcon-2000 is a special-purpose microprocessor, which measures the amplitude, frequency and pulse width of the incoming signals. If the signal is accepted as a genuine radar transmission from a ship, the high-speed logic circuits will re-tune the transmitter to the incoming signal frequency **(frequency agile)** and trigger the coded response. All these measurements are performed in less than 667 nanoseconds. If the radar transmission is identified as a reflected side lobe (same frequency but much lower amplitude), the **dual-token side lobe suppression** circuitry inhibits the RACON response to prevent clutter on the ship's radar.

Using the duration of the incoming radar pulse, the signal processor automatically adjusts the length of the coded response to match the range scale setting of the interrogating radar **(proportional scaling)**. This prevents the response from covering too much of the radar screen on short-range settings and being too small on long-range scales.

A further important benefit offered by the Phalcon-2000 is the **external programming** feature. The racon code service period, sensitivity, and response code can be programmed in the workshop or on site, using an external RS-232 serial interface (connected to a laptop computer or other ASCII compatible terminal). It is not necessary to open the racon to gain access to internal switches to set these functions. **The unit may be programmed to show any Morse Code letter.**

The Phalcon-2000 is an extremely effective and reliable aid to navigation. An automatic self-test feature monitors the performance of the racon. The Phalcon-2000 will, every 60 minutes or 5°C change in temperature, initiate a fifteen second test program that checks the operation and frequency accuracy of the racon. If all is not well, an audible signal as well as a digital alarm is generated, which can be fed to a monitoring system.

The Phalcon-2000 has a cylindrical cast base, which contains the microwave electronics and signal processing circuits. Transmit, receive, processor and power supply cassettes are rack mounted for easy access. The X and S cylindrical slot antenna features a ± 10° vertical response range. The antenna is protected by a UV-stable, polyurethane radome which is transparent to microwave energy.

With the advanced electronics in the Phalcon-2000, power consumption (responding to multiple radars) is, on the order, of two-thirds of the power consumption of competing products. It is not necessary to increase the capacity of the solar or primary battery power supply when replacing ERICON and Marconi RACONS with Phalcon-2000s.

Phalcon-2000 includes a harbor-blanking feature. When the racon receives an inhibit signal from a VTS radar, it will not respond to a VTS radar.

PHALCON-2000 WITH PRESSURIZATION KIT

Applications: Important Navigation Buoys, CALM, SALM, SPM Buoys, and Safe Passage under Bridges, Offshore Structures, TLPs and FPSOs.

CERTIFICATION:

EC-TYPE EXAMINATION CERTIFICATE
Certificate Number: DEMKO 02 ATEX 131807X
Directive/s: 94/9/EC of March 1994
Standard/s: EN 50014: 1997 e incl. A1+A2 and EN 50016: 1995
Coding: II 2G EEx pedm IIC T4 (Tamb -20°C to +50°C)
II 2G EEx pedm IIC T3 (Tamb -40°C to +70°C)

Form No.: 042511A

SPECIFICATIONS

- **Input Voltage**: 9-36 volts DC.
- **Quiescent Power Consumption**: less than 0.05 Watts (average).
- **Operational Power Consumption**: (33% Duty Cycle 10 Radars Present) 1.4 Watts (average). (33% Duty Cycle 100% Interrogation) 1.5 Watts (average).
- **Pulsed Output Power**: X-Band 1.0 Watt minimum, S-Band 0.5 Watt minimum.
- **Response Code**: Programmable – All 26 Morse Code Letters.
- **Frequency**: X-Band (9300-9500 MHZ), S-Band (2900-3100 MHZ)
- **Frequency Accuracy**: ± 2 MHZ (<200ns radar pulse X-band and S-band), ± 1 MHZ (>200ns radar pulse X-band and S-band).
- **Communications**: RS-232/RS485 Serial Interface for programming, external diagnostics and alarm outputs.
- **Failure Alarm**: Audible Alarm and Digital Alarm.
- **Response Delay**: 0.667µs (X and S-band).
- **Receiver Sensitivity**: -40 dBm (X-band), -40 dBm (S-band).
- **Polarization**: Horizontal (X-band), Horizontal/Vertical (S-band).
- **Azimuth Response**: 360° (± 1 dB (X and S-band)).
- **Vertical Response**: ± 10° (-3 dB (X and S-band)).
- **Sidelobe Suppression**: Dual token SLS (X and S-band).
- **Temperature Range**: -20°C to + 50°C.
  -40°C to + 70°C
- **Ingress Protection**: IP 67 (inert gas pressurization).
- **Shock and Vibration Tests**: Certification to MIL STD 810D.
- **Dimensions**: Height: 705mm
  Diameter: 350mm Weight: 20 Kg
- **Mounting**: 3 each M12 bosses on 200mm PCD.
- **Standard Accessories**: 2m power/communications cable w/waterproof junction box and terminal strip.
- **Optional Accessory**: Handheld programmer unit.
- **Antenna Gain**: X-band 5 dBi
  S-band 3 dBi

  Function of required azimuth and elevation bean pattern.

Specifications subject to change without notice

Pharos Marine – England
Steyning Way, Hounslow
Middlesex, England TW4 6DL
Phone: 44-20-8538-1100
Fax: 44-20-8577-4170
sales@pharosmarine.com

AUTOMATIC POWER – HOUSTON MAIN OFFICE & FACTORY
213 Hutcheson St.
Houston, TX USA 77003
P.O Box 230738
Phone: 713-228-5208
Fax: 713-228-3717
sales@automaticpower.com

Pharos Marine – Singapore
35 Tannery Road
05-05 Tannery Block, Singapore
347740
Phone: 65-6-747-9325
Fax: 65-6-746-0478
abpharos@singnet.com.sg

Automatic Power – West Coast USA
26 Pizarro Ave.
Novato, CA USA 94949
Phone: 415-382-6296
Fax: 415-382-6299
dolantp@aol.com

Automatic Power – Gulf Coast USA
198 Technology Lane
Gray, LA 70359
Phone: (985) 223-8700
Fax: (985) 223-8710
dcummiskey@automaticpower.com
rleblanc@automaticpower.com

Automatic Power – East Coast USA
204 Parkway Drive
Williamsburg, VA USA 23183
Phone: 757-253-2817
Fax: 757-220-8166
APIatlantic@aol.com