

PHALCON[®] - 2000 RACON



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.

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 $\pm 10^\circ$ vertical response range. The antenna is protected by a UV-stable, polyurethane radome which is transparent to microwave energy. IP 67 rated, the Phalcon-2000 does not require an expensive quarterly inert gas purge with its associated servicing time and equipment requirements.



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.

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

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:** 0.667 μ s (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:** $\pm 10^\circ$ (-3 dB (X and S-band)).
- **Sidelobe Suppression:** Dual token SLS (X

and S-band).

- **Temperature Range:** -40°C to + 70°C.
- **Ingress Protection:** IP 67 (inert gas pressurization not required).
- **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.

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