

## FACT SHEET

# Low frequency deterrents

## FLEX & RING

Our award-winning Ace Deterrents are:

- Low frequency, MMPA compliant
- Highly targeted with a trigger system, with ramp-down that minimises noise pollution
- Simple, reliable and easy to set-up with remote monitoring and management

Your first choice for animal welfare

### What it is

A unique low-frequency deterrent, which targets marine predators (seals, sea lions), whilst avoiding the specialised hearing ranges of dolphins and porpoises.

### Why we developed it

We originally developed this deterrent for use in areas with a prevalence of protected species, such as dolphins and porpoises. We worked with academics from St Andrews University to look at how we could deter predators but mitigate the noise impact on non-target species.

### How it works

- Deployed on fish farms, outside the netting, and often attached via a rope to the pen
- It has a triggered mechanism that produces a low frequency sound to startle any predators
- It can be targeted specifically to seal and sea lion hearing thresholds
- Delivers a range of randomised frequencies and tonal patterns to avoid habituation issues

### Key features

- MMPA compliant
- Remote monitoring and control portal
- Ramp down, slow start
- Triggering options available
- Modulated frequency and randomised tonal patterns avoid habituation
- Avoids specialised hearing range of porpoise and dolphins
- Modular, easy to deploy – plug and play
- Battery back-up allows operation of up to 24 hours of use with access to mains

### Welfare benefits

- Avoids habituation – modulated frequency range, randomised tonal patterns
- Targets seal hearing range while avoiding the specialised hearing range of porpoise and dolphins – very low impact on high frequency cetaceans
- Will not affect farmed fish species – outside of their hearing range
- Helps protect fish from predation which can cause serious injury, mortality, fish escape and increased stress

### Sustainability factors

- Often fewer low frequency systems are required meaning less power draw
- Rechargeable batteries
- Trigger ensures the devices are only being used when required

### Ideal set up

Depending on the level of predation - or predators in the region - fewer low-frequency units may be required on a pen group.

### Licenses

MMPA Compliant



*"It's so important to have a real deterrent and so far we've had zero mortalities attributed to seals. The web portal is accessible from the shore and gives us total control over each individual unit. This is a huge improvement on any other systems I have used in the past."*

**Dougie Shaw**

SITE MANAGER, SCOTTISH SALMON COMPANY



Contact us to find out how we can help you achieve your goals [acequatec.com](http://acequatec.com)





## Universal technical specifications

<b>Power draw</b>	12V deep-cycle non-spillable gel battery Each pelicase and top box system will draw a maximum of 250W	<b>Frequency range</b>	Flex (Setting 1): 0.8 kHz – 1.2 kHz Ring (Setting 2): 1.0 kHz – 2.0 kHz
<b>Input voltage</b>	AC mains input is a universal supply from 90–260 volts (single phase)	<b>Sound level</b>	Average within a transmission: (re 1uPa rms @ 1m) Flex: 176 dB re 1uPa rms@1m Ring: 180dB re 1uPa rms@1m
<b>Connections</b>	16A 230V Mains Amphenol Ecomate C016	<b>Duty cycle (min/max)</b>	0.9% to 11%
<b>Average current draw</b>	Average power draw = 100-150W Average daily consumption = 2.4kW hours	<b>Tone profile</b>	9x short duration, randomised pulses of sound that avoids habituations and hearing loss
<b>Effective Range</b>	70m radius (15000 sq m)	<b>Ramp-up/soft-start time</b>	15 minutes
<b>UW Extension cable</b>	Polyurethane Jacket	<b>Operating temperature</b>	-20°C to 40°C
<b>UW Ext. cable length</b>	30m / made to measure for specific sites	<b>Manufacture license certifications</b>	ISO 9001:2005 Low Voltage Directive (LVD) 2006/95/EC – EN61010-1:2001 Electromagnetic Compatibility Directive (EMC) 2004/108/EC EN61000-3-2:2000 EN61000-6-2:2001 EN61000-6-4:2001
<b>Battery coverage</b>	12/24 hours – varies on scram rate Real Time Clock for data logging	<b>Waterproof rating</b>	IP68(fully submersible) Pelicase = IP68 TopBox = IP68
<b>Materials used</b>	TopBox - 316 Stainless Steel Peli = HDPE; QuadBox = POM Ring = Polyurethane; Pod + Cage = Nylon	<b>Fault reporting</b>	Warning light, email, online alerts
<b>Depth rating</b>	From 10m to Unlimited		
<b>User rate</b>	12-144 scrams per hour Avg. tone length = 2.8 seconds		

## Individual technical specifications

	Ring	Flex	Speaker
<b>Weight Air/Water</b>	Ring+Pod+Cage = 42KG/14KG	Flex+Pod+Cage = 36KG/11KG	Speaker+Pod+Cage = 41KG/7KG
<b>Dimensions</b>	Ring+Pod+Cage = 846mm H x 500mm W	Flex+Pod+Cage = 931mm H x 330mm W	Speaker+Pod+Cage = 1032mm H x 450mm W