Tideland Signal Corp.

featuring Aids to Navigation *Products*

4.1 Audible Aids (Fog Signals)

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Rev	**Description**	**Date**	**By**

A. Design Considerations

Modern fog signals are electrically powered and automatically broadcast a 360° beam of sound in the horizontal plane to a pre-selected code. On offshore oil structures, they are required to produce sound pressure levels at 1 meter equivalent for 2 nm range. Where more than one is necessary to provide all-around coverage, they require synchronizing. At unattended sites where they sound constantly, circuitry is provided to allow them to be switched off during maintenance visits.

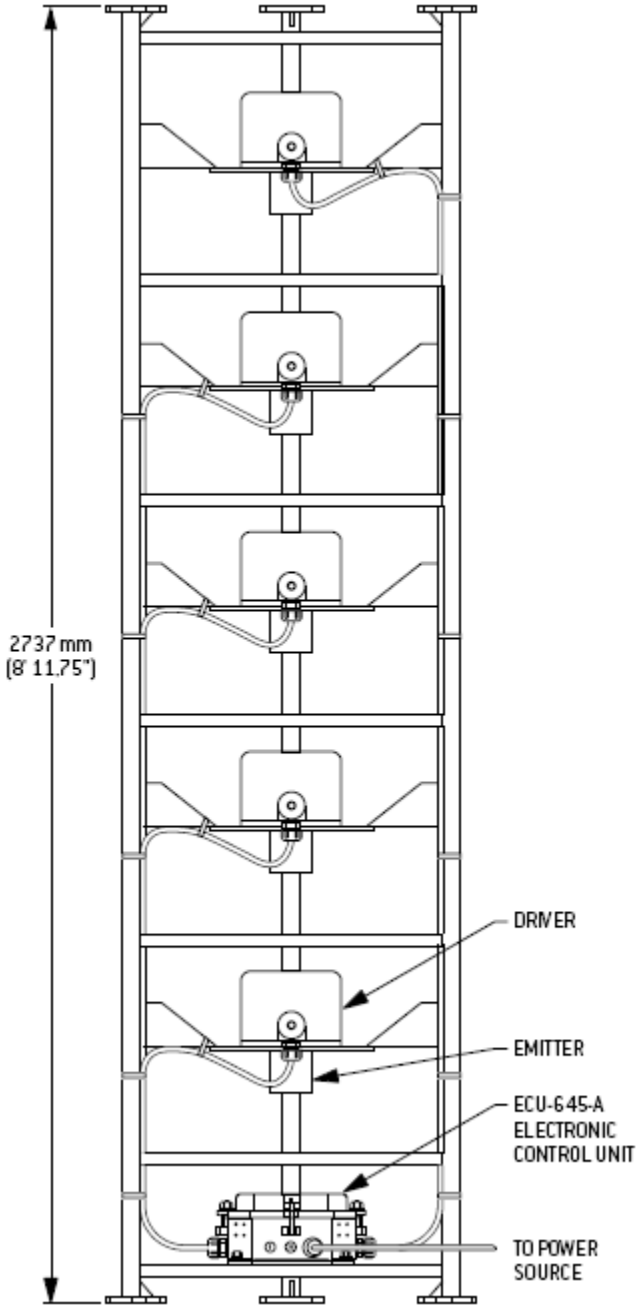
They can be powered either from primary or solar charged battery banks; where AC power is not available, through an AC/DC power supply. To cover use both in hazardous areas and in General Marine Use (GMU) they are available with a wide selection of codes, including the Morse code, sometimes used in certain AtoN areas.

Along with meeting these design criteria Tideland's fog signals are built with corrosion resistant materials designed to withstand the riggers of prolonged exposure in a marine environment. Printed circuit cards have gold-plated plug-in contacts, and selected burned-in silicon transistors are used for maximum reliability. Urethane coating protects the electronics from corrosion.

Patented Syncrostat circuitry allows two or more fog signal units to sound sequentially or in unison.

All Tideland fog signals are shipped fully assembled and ready for field connection. Standard 12.7 mm (0.5 inch) cable connectors are provided with optional cable entry sizes available upon request.

A typical construction is shown on the right. This is the AB-560 comprising five (5) drivers and a electrical control unit (ECU).



Fog Signals are available in several different sizes and power ratings as indicated below. The AB-860, 560 and 26 are used in most offshore applications and are rated at UL Class 1, Division II. The AB-68 is rated for use in ATEX, Category 2 areas.

Model	AB-860	AB-560	AB-68	AB-26
Range	2 miles	2 miles	2 miles	½ mile
Input Power to Drivers	43 W at 645 Hz	71 W at 645 Hz	118.3 W at 800 or 790 Hz	15 W at 660 Hz
Drivers/Emitters	8	5	6	1
Drain when Sounding	4.2 A	7.2 A	9.86 A	1.7 A
Offtime Current at 78F	30 mA	30 mA	30 mA	30 mA
Construction Structure	Galvanized Steel	Galvanized Steel	Stainless Steel	6061-T6 Aluminum
Driver Housing	GRP	GRP	Manganese bronze	5052-H32 Aluminum
Mounting	Base down	Base down	Base down	Base down
Weight	299 kg (660 lb)	168.6 kg (375 lb)	214 kg (471 lb)	28.3 kg (63 lb)
Electronic Control Unit	External ECU-645-A	External ECU-645-A	External ECMU-800 or ECU-800	Internal ECU-660
Sound Pressure Level	133.2 dB At 1 metre equivalent	133.2 dB At 1 metre equivalent	133.4 dB At 1 metre equivalent	120.5 dB At 1 metre equivalent

B. Fog Signals with Unitized Systems

Tideland's Class A and Class B Single Lift systems are self-contained solar-powered obstruction light/fog signal units used where limited space is available. They are ideal for marking remote marine obstructions, such as wellheads, reefs, or offshore rocks on which mains power is unavailable. Each single lift system is skid mounted and features lifting eyes placed for proper balance during single-lift installation.

CLASS A SINGLE LIFT

Tideland's Class A Single Lift system meets or exceeds the requirements for use in areas that require a 5-mile white light and a 2-mile fog signal. The Class A Single Lift system includes the following components:

- ML-300 MaxLumina marine lantern and TF-3B MicroPower multi-code flasher/lampchanger with clear lens and 12-volt, 0.55-ampere lamp, or MLED-300 marine lantern with MaxiHalo-60 or MLED Dual RETRO light sources. Over 240 field-selectable flash codes are available.
- AB-560 Audiobeam®, U.S. Coast Guard-approved 2-mile fog signal, with ECU-645-A electronics.
- 180 watt solar array.
- 1,000 ampere hour rechargeable battery array in a weatherproof battery box.
- Required mounting hardware.

The electric energy output from the solar generator battery is separate for the fog signal and the light. The energy cell bank is sized as a stand-alone system for continuous service 365 days per year.

CLASS B SINGLE LIFT

The Class B Single Lift system meets or exceeds the requirements for use in areas that require a 2-mile white light and a ½-mile fog signal. Tideland's standard Class B Single Lift system includes the following components:

- ML-155 MaxLumina marine lantern and TF-3B MicroPower multi-code flasher/lampchanger with clear lens and 12-volt, 0.55-ampere lamp or MLED-155 marine lantern with MaxiHalo-60 or MLED Dual RETRO light sources. Over 240 field-selectable flash codes are available.
- AB-26 Audiobeam®, U.S. Coast Guard-approved 1/2 – mile fog signal, with internal ECU-660 electronics.
- 60 watt solar array.
- 300 ampere hour battery array in a weatherproof battery box.

Class B Single Lift system is available in two arrangements for solar power, one with a frame-mounted solar generator, and the other with a pedestal-mounted solar generator. A third arrangement accommodates primary batteries instead of a solar generator.

C. Fog Detector

The fog signal can be controlled by a fog detector with an override available at the control panel. The detector works on the forward scatter principle for increased reliability and can be certified for use in a Zone 1, Zone 2 or safe area locations.

D. Fog Signals with Syncrolan Systems

The *Syncrolan* aids to navigation system is the latest development of Tideland Signal's very successful platform marking system that has been widely used around the world with a history of reliable service in some of the harshest environments on the planet stretching back over 30 years.

Tideland Signal's design philosophy is to make each of the lanterns and fog signals autonomous units and therefore each unit has its own U coder. In this way the service to the mariner is not affected by any central control panel failure. The central panel provides power distribution and monitoring and alarm indications. The system offered has a central battery. An alternative "de-centralised" system configuration is available where each light and fog signal station has its own power supply and battery and a central alarm panel with photocell override and fog signal silent switch.

The system comprises light stations, subsidiary lights, fog signals, a central control panel and central battery. A fog detector and racon (radar beacon) are available. All parts of the system are offered suitable for use in Zone 1 (ATEX Cat 2) hazardous areas.

COMPONENTS OF A MAIN/SECONDARY LIGHT STATION

The light station comprises the main AC powered main 15nm light and the secondary or standby DC powered 10nm light mounted on a pedestal with an Exe junction box to accept field cables.

Main Light
The ML-300 FLMC-4 features a high efficiency 400W dual filament lamp with TL1000 lampholder. The FLMC-4 generates the Morse U flash character and monitors the performance of the lantern.

Secondary Light
The ML-300 secondary light is fitted with a DuoFlash Ex twin filament flasher and 10.3V 40W twin filament lamps the Morse U flash character is generated by the DuoFlash Ex twin filament flasher which also monitors the performance of the lantern.

COMPONENTS OF A FOG SIGNAL/SUBSIDIARY LIGHT STATION

The AB-68 fog signal consists of a vertical array of six TDA-24450 driver units sounding in unison to provide a range of 2 nautical miles. To ensure maximum reliability and to meet the requirement for a secondary fog signal, two ECU 800s are used to generate the Morse U character, one duty and one standby. A current monitor will automatically change over from the duty to the standby ECU and report an alarm to the central panel. Any 2 driver units are sufficient to meet a ½ mile range.

The ML-155 red subsidiary light also features the DuoFlash Ex twin filament flasher as fitted to the secondary light thereby minimising spare parts holding. A 10.3V 7.3W twin filament lamp provides a 3-mile light.

