

## **1. General**

The ZETFON-Fonomat 4x70s works in accordance with the inland navigation rules (BinSchUO, BinSchStrO and RheinSchPV) in respect of the release of sound signals in restricted visibility and while navigating under radar. The unit also corresponds with the Federal Act No. 103 - concerning the introduction of a "keep clear signal" on the inland waterways of the Federal Republic of Germany. Moreover, the ZETFON-Fonomat can be used as command system.

The type 4x70s is suitable for vessels of all lengths.

## **2. Construction**

The ZETFON-Fonomat 4x70s is an electronic signal device consisting of:

### **2.1 4 pcs. ZETFON 70s**

fundamental frequency: 310 Hz = 5 %

intensity at 1 m distance: 129 - 134 dB(A)

Note: In order not to exceed the required own sound level of 70 dB(A) at the steering stand in head position of the steerman during normal operation all signal units must be installed at sufficient height. The sound should spread freely ahead and as far as possible astern.

### **2.2 Control and Amplifier Unit ZP 9 Mi**

comprising:

2.2.1 1 weather and vibration resistant casing with six cable glands.

2.2.2 1 power supply PC-board with protection against cross-connection of terminals, amplifier and high-level as well as terminal strip.

2.2.3 1 control PC-board with sound generator, electronic lock and microphone amplifier.

2.2.4 1 transformer

input: with manoeuvre signal lamp - approx. 190 Watt

current consumption: with manoeuvre signal lamp - approx. 8 Amps

voltage: 24 V DC (-10%/+20%)

closed circuit current: approx. 0.1 Amps

### 2.3 Control Unit ZETFON-Fonomat

The operating elements in the front plate take the following functions (from top to bottom:

#### 2.3.1 Key for manual sound signals

2.3.2 Key for release of triple-tone signal according to § 4.06 of the BinSchStrO: three times three sounds of different frequency (230 Hz, 295 Hz) in succession without interruption with a duration of about 3x2 seconds. Each sequence of the three sounds starts with the lowest and ends with the highest sound.

2.3.3 Key for release of signal according to § 6.33 of the BinSchStrO: 1 prolonged sound within 60 seconds - sound signal in restricted visibility for all vessels not navigating under radar.

First push of the key: "SIGNAL ON"  
Second push "SIGNAL OFF"

2.3.4 Key for release of "keep-clear signal": short - prolonged sound repeated without interruption for at least 15 minutes according to Federal Act 103 for the introduction of a "keep-clear signal" on the inland waterways of the FRG and according to § 8.14 of the BinSchStrO.

First push of the key: "SIGNAL ON"  
Second push: "SIGNAL OFF"

This key is provided with a protective cap to avoid unintentional release.

2.3.5 An adjustable potentiometer serves to dim the pilot lamps glow dimmly. They lighten up brightly when cut on and a signal is being released.

### 2.4 Microphone to use the signal unit as command system

The microphone is provided with a speaking key and a potentiometer for the volume control of the commands. The socket for connection of the microphone is installed in the front plate of the control unit.

Note: All sound signals have priority to light signals!

### 2.5 Sound Signal Lamp TS 11 - 25 W

According to § 4.01 of the BinSchStrO on all engine powered vessels the sound signals must be accompanied by equally long light signals. These must be yellow, bright and visible from all directions. In case of the triple-tone signal only the low sound must be accompanied by a light signal.

### **3. Installation**

#### **3.1 ZETFONs**

The ZETFONs 70s are supplied readily installed on a stainless rail which is to be screwed on a console on the mast or the bridge roof. The whistles must be installed as high as practicable on a vessel, in order to reduce interception of the emitted sound by obstructions and also to minimize hearing damage risk to personnel. The ZETFONs have to be installed in a way that the sound horns point in the forward direction of the vessel. The sound horns must be arranged vertically.

#### **3.2 Control and Amplifier Unit**

The control and amplifier unit ZP 9 Mi must be installed within easy reach of the bridge or in the bridge console. The minimum distance to the magnetic compass is one meter. The control unit ZETFON-Fonomat with the operational elements must be installed in the front plate of the bridge console easily accessible to the bridge personnel.

### **4. Electric Installation**

The electric installation has to be carried out in accordance with the enclosed connection diagram.

#### **4.1 Cable and Cable Connections**

The control and amplifier unit receives its operating voltage 24 V DC from the board mains. Immediately after connection, the unit is ready for operation. The heating requires a separate 24 V DC supply.

Note: All necessary cables must be in accordance with the minimum requirements of the corresponding classification societies. Cables with a cross section of less than 1.5 mm<sup>2</sup> may not be used.

If - after installation - during operation and after strong mechanical stress the unit produces malfunctions, first of all the cables and cable connections must be checked for proper seat. If - when switched on - the unit produces crackling noise when cables are moved, the cables causing this noise must be exchanged.

#### **4.2 Protection against Cross Connection**

If, by error, the battery poles at the connection of the control and amplifier unit ZP 9 have been mixed up the diode D1 causes the release of fuse F1. After changing the poles and replacing the fuse the unit is ready for operation again.

#### **4.3 Fuses**

The fuses  $\varnothing$  5x20 oK, 6,3 and 2 A are arranged on the PC-board for power supply.