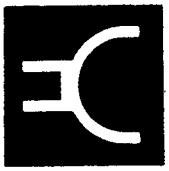

CODAN

Installation and
operation handbook

HF 4000 automatic antenna tuner type 4203

CONTENTS

1 Introduction

The antenna tuner matches the 50 ohm transceiver output to the impedance presented by the particular antenna, or antennas installed on the vessel.

The Codan type 4203 tuner is fully automatic requiring the operator only to press a button on the transceiver to achieve tuning for the channel selected.

This manual describes the installation of the unit and its interconnection with Codan HF4000 series or type 8525S transceivers.

1.1 Specification

Frequency Range:	2 - 23 MHz
Channel Capacity:	Unlimited
Power Rating:	400 W PEP; 200 W CW
Power Requirements:	12 V DC (nom.) at 1.5A (max.) supplied from the transceiver
Dimensions:	320 mm (W) x 210 mm (D) x 270 mm (H) over terminals
Weight:	5.5 kg
Case:	Ruggedised PVC; splashproof
Wire and whip antenna:	For single antenna installation: Frequency: 2 to 23 MHz 8.5 metre whip (unloaded) or long wire with minimum length 8.5 metres; maximum length 13 metres

For Dual antenna installation:

Antenna 1:
Frequency 2 to 5 MHz
5.5 metre or 6.7 metre whip (loaded to 4.6 MHz)

Antenna 2:
Frequency 5 to 23 MHz
5.5 metre or 6.7 metre whip (unloaded)

1.2 Accessories

The unit is normally supplied with 10 metres of coaxial cable and 10 metres of control cable.

2 Installation

2.1 Grounding Requirements

2.1.1 General

Because the unit is used with high power transceivers working over a wide frequency range adequate grounding is absolutely essential. A very low impedance path must be provided to the vessel's hull (if steel), keel, or grounding plate. For wooden or fibreglass vessels a copper sheet must be fixed to the hull in such a position that it will remain immersed under all sea conditions. Proprietary marine radio grounding plates are available for this purpose. One or more bonding straps should be run from the ATU to the grounding plate. Since the RF current flows only on the surface of the conductor a thin (0.5 mm) strap, of adequate width, is sufficient. Alternatively copper tubes may be used. The grounding straps or tubes should be secured under the mounting bolts of the grounding plate or copper sheet.

2.1.2 HF4000/8528S-H Series

Because of the high power (up to 400 W) of these transmitters it is recommended that as a MINIMUM 100 mm wide copper strip or 23 mm (or two 12.5 mm) diameter copper tubes be run directly between the tuner's two grounding bolts and the hull or other grounding point. For wooden or fibreglass vessels the copper sheet should have an area of at least two square metres. If proprietary grounding plates are used at least two should be installed.

A ground strap to the power amplifier and the control unit may be required for stability in some installations.

2.1.3 8525/8

The following grounding requirements are recommended for the 8525/8 and other transmitters up to 125 W.

The straps from the tuner's two grounding bolts should be least 23 mm (but preferably 50 mm) wide and proportionately wider (or multiple straps) for longer runs. Alternatively 20 mm diameter copper tube may be used. Copper sheet or grounding plates must have an area of at least 0.25 square metres.

THE IMPORTANCE OF A GOOD GROUND CANNOT BE OVERSTRESSED.

2.2 Mechanical

The 4203 tuner is housed in a splashproof PVC case. It should not be exposed directly to the weather, but mounted so as to allow the minimum possible length of antenna lead-in. If two antennas are to be used, as recommended, the unit should be mounted nearest the higher frequency one (Antenna 2).

Additionally, the tuner must be oriented so that the installation technician can readily remove the lid for access to the cable terminal block and antenna option link plug. It should be remembered that, as very high voltages (up to 8 kV) appear at the base of Antenna 1 on the 2 MHz and 4MHz bands, several centimetres clearance around the Antenna 1 terminal must be allowed.

Firmly mount the tuner with four stainless steel bolts or screws through the mounting holes provided.

2.3 Interwiring

The two 10 metre length cables normally supplied run from the antenna tuner to the power amplifier (PA) (when used with HF4000) or transceiver (when used with 8525/8). One is the coaxial cable with UHF type connectors fitted to each end; the other is a multi-core control cable terminated at one end with a 15-way plug to connect to the PA or transceiver and the other end free for installation purposes.

NOTE: The connector used to terminate the multi-core control cable in the 8525/8 installation is different to that used in the HF4000. The cable/connector assemblies are:

(a) HF4000 Assembly No. 08-03016-010 (also applies to 8528S-H series)

(b) 8525/8 Assembly No. 08-03236-010

Control cables preparation and termination should be carried out as follows:

1. Run both cables from the PA or transceiver to the tuner.

2. Screw the coaxial connector firmly to the socket on the tuner.

3. Trim excess length from the control cable allowing sufficient for connection inside the tuner.

4. Remove the lid from the tuner (six captive screws). Note the 5-way orange coloured terminal block in line with the cable entry point.

5. Strip about 10 cm of outer sheath from the control cable, and push the cable through the locking bush into the tuner until the outer sheath enters it and is held firmly.

6. Tighten the bush locking ring to lock and seal the control cable in place.

7. Remove insulation as appropriate and connect the wires to the four terminals as shown in Table 1 or 2, below. Note that terminal number 5 is not used in HF4000 installations.

8. Insulate and tie back the remaining wires in the cable.

Table 1 HF4000 Connections/8528S-H Series*

	Terminal Number	Function	Wire	PA Connector Pin Number
DO	1	Supply -ve	Black & Violet	9,10
	2	Supply +ve	Red & Brown	3,4
	3	'Tune' lamp	Green	12
	4	'Tune' button	Blue	15
	*5	Scan	White	14

Table 2 8525/8 Connections

	Terminal Number	Function	Wire	PA Connector Pin Number
DO	1	Supply -ve	Black & Violet	14 & 15
	2	Supply +ve	Red & Brown	12 & 13
	3	Tune Indicator	Green	11
	4	PTT/Tune	Blue	4
	5	Scan	White	5

2.4 Antennas

For maximum efficiency it is recommended that two whip antennas be installed as specified in para 1.1 of this handbook.

A moveable antenna option link plug inside the tuner, located adjacent to the fuse on the control board, must be correctly positioned during installation to ensure the tuner automatically selects the appropriate antenna for each operating frequency. The four option positions are shown in Table 3, below. The unit normally leaves the factory with option 2 selected.

CAUTION

THE LINK MUST BE SET FOR OPTION 4 BEFORE ANY ATTEMPT IS MADE TO TUNE OR TRANSMIT WITH ONLY ONE ANTENNA CONNECTED. FAILURE TO DO THIS MAY RESULT IN DAMAGE TO THE UNIT.

Table 3 Antenna Selection

Antenna option link position	Antenna 1 selected	Antenna 2 selected
1	2 - 3 MHz	3 - 23 MHz
2 (ex factory)	2 - 5 MHz	5 - 23 MHz
3	2 - 7 MHz	7 - 23 MHz
4	2 - 23 MHz	

Antenna lead-ins should be kept as short as possible and be well clear of metal structures and other wiring. As very high voltages are generated during transmission below 4 MHz at least 100 mm clearance to other conducting surfaces is recommended. The lead-ins should also be positioned to minimise the chance of accidental contact by crew members otherwise painful burns may be incurred.

3 Operation

The unit has no controls that require setting during operation. Full instructions for the operation of a transceiver with the unit connected are given in the appropriate transceiver manual.

4 Service

Should the type 4203 antenna turner require service, reference must be made to either the HF4000 service manual - order code 089 or the type 4203 service manual - order code 2023.