FU Tiller S/I

Operation Manual

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Contents

Preface

The Alphatron AlphaPilot MFM system is a type approved heading control system, designed to fit vessels of any size, including high speed crafts.

The FU Tiller S/I is part of the AlphaPilot MFM system and is used on vessels with 2 independent rudders.

The FU Tiller S/I makes it possible to control (in manual FU steering mode) the rudders independently, using 2 tillers, or synchronous, using 1 tiller. On each steering position, 2x FU Tiller S/I are installed.

- Thoroughly read this operation manual before operating the equipment.
- We recommend keeping this manual nearby the equipment to ensure ready access to it.

Revision History

Revision No.	Date	Description	Author
1.0	18-04-2018	First release	J. Kreeft

Glossary

The glossary contains a list of abbreviations and a list of definitions.

Abbreviations

Abbreviations as used in this manual are explained in the table below.

FU	Follow-Up
PS	Port Side
S/I	Sync/Independent
SB	Starboard Side
STBY	Standby

Definitions

The meaning of standard definitions as used in this manual are explained in the table below.

Alarm	Audio and visual signal announcing a condition requiring attention. The audio continues until acknowledged. The acoustic noise pressure of the alarm is at least 75 dBA but not greater than 85 dBA at a distance of 1 m (IEC 60945). The visual indication continues until the alarm condition is removed.
AlphaPilot MFM	Alphatron brand name for the heading control system.
Autopilot	A Heading Control System.
Indication	Visual display of any message to the user which may be accompanied by a low intensity acoustic signal to gain attention.
Steering mode selector	A switch provided for the selection of manual steering modes and automatic steering devices.
Tiller	A device that is used to turn the rudder, which then steers the boat.

Safety Information

The signal words DANGER, WARNING and CAUTION used in this manual indicate the degree of hazard that may be encountered by the user. These words are defined as follows:

⚠️	**DANGER**	Indicates a hazardous situation which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations.
⚠️	**WARNING**	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
⚠️	**CAUTION**	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

The signal word NOTICE used in this manual indicates information considered important but not related to injury. It is typically used to prevent damage to equipment or property.

To safely operate this system, the following DANGERS, WARNINGS, and CAUTIONS must be adhered to. Failure to comply with the precautions or with specific dangers, warnings, and cautions elsewhere in this manual violates safety standards of design, manufacture, and intended use of the equipment. ALPHATRON MARINE assumes no liability for the customer's failure to comply with these requirements.

⚠️	**WARNING**	Do not disassemble or modify the equipment. Otherwise, it may cause a fire, or you may suffer an electrical shock.
⚠️	**WARNING**	Immediately turn off the power and disconnect the power supply cable if the equipment is generating any smoke or odour or is overheated. Immediately inform your local service agent of the symptom to have it repaired. Prolonged equipment operation under such a condition can cause a fire or electric shock.
⚠️	**WARNING**	Do not place a container containing liquid on the equipment. Otherwise, it may cause a fire, or you may suffer an electrical shock if knocked over.
⚠️	**WARNING**	When unplugging the instrument, be sure to remove the cord terminal correctly. If the cord is pulled, the cord may get damaged resulting in a fire or an electrical shock.

Warranty

To not to adversely affect the warranty, the following notices must be adhered to.

NOTICE	Operating personnel must not remove equipment covers. Only personnel trained and certified by ALPHATRON MARINE must make component replacement and internal adjustment.
NOTICE	Do not disassemble or modify the equipment. Failure to observe this instruction may cause equipment failure, and it will void the warranty.
NOTICE	Any modification to this equipment without prior written permission from ALPHATRON MARINE will void the warranty.
NOTICE	Installation of this product shall only be done by a certified installation company approved by either ALPHATRON MARINE or by an official ALPHATRON MARINE distributor. Acting otherwise will void the warranty.
NOTICE	This product contains no operator serviceable parts. Service and repair shall only be carried out by personnel trained and certified by ALPHATRON MARINE.
NOTICE	Do not place a container containing liquid on the equipment. The equipment can be damaged if knocked over.
NOTICE	When cleaning the surface, do not use any organic solvent such as thinner or benzine. Otherwise, the paint and markings on the surface may get damaged. For cleaning the surface, remove the dust and debris and wipe with a clean dry cloth.

Introduction

The FU Tiller S/I makes it possible to control (in manual FU steering mode) the rudders independently, using 2 tillers, or synchronous, using 1 tiller. On each steering position, 2x FU Tiller S/I are installed.

The FU Tiller S/I has 1 handle and multiple buttons:

- The alarm speaker button will illuminate when there is an alarm. The button is used to mute the speakers of the FU Tiller S/I and interconnected modules.
- Buttons **DIM -** and **DIM +** are used to control the brightness level of the FU Tiller S/I and interconnected modules.
- Button **INDEP** is used to enable independent rudder control.
- Button **FU** is used to release/take FU control.
- Button **SYNC** is used to enable synchronous rudder control.
- The handle is used to steer (step less control).

Figure 1: FU Tiller S/I

Enabling FU control

Push the button **FU** to enable FU control*. The control mode indicator **FU** and handle indicator will illuminate, meaning that FU mode is enabled, and that the handle is enabled.

Note that independent rudder control is enabled by default.

*Note that control must be allowed, see subsection 'Control allowed/not allowed' on page 10. Note that another active controller may need to allow control handover first, see subsection 'Control handover' on page 11.

Figure 2: STBY mode enabled	Figure 3: FU mode enabled

Control allowed/not allowed

When not in control, the FU Tiller S/I is in standby mode and handle is disabled (the control mode indicator **STBY** is illuminated and the handle indicator is not illuminated). The button **FU** is illuminated when allowed to take control (see Figure 4 and Figure 5).

FU control is steering in manual FU steering mode; therefore, the Mode Switch must be in position **MAN** (Mode Switch 3 Pos) or **AUTO|MAN** (Mode Switch 2 Pos).

FU control is not allowed when the Mode Switch is in position **NFU** (Mode Switch 2 Pos & Mode Switch 3 Pos) or **AUTO** (Mode Switch 3 Pos)).
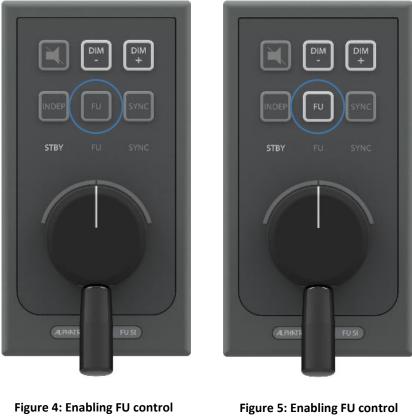

Figure 4: Enabling FU control not allowed	**Figure 5: Enabling FU control allowed**

When a non-illuminated button is pushed, the speaker produces 4 short successive beeps to indicate that the operation is not valid.

Control handover

If applicable, handover of control must be allowed first by the active controller to allow the FU Tiller S/I to take control (i.e. enable FU control).

The method for control handover is pre-set during commissioning. Two system settings are possible, namely 'Take control' or 'Release/take control'.

Take control

Any controller can take control. Control handover allowance is not applicable.

Procedure for FU Tiller S/I:

- Push the button **FU** on one of the two tillers to enable FU control. Control mode indicator **FU** and the handle indicator will illuminate on both tillers, meaning that the respective mode is enabled, and that the handles are enabled.

Release/take control

Any controller can take control, only when the active controller allows control handover.

Procedure for FU Tiller S/I:

- Take control
  Allow control handover from the active controller (refer to the respective operation manual for the procedure). Button **FU** will illuminate to indicate that FU control is allowed. Push the button **FU** on one of the two tillers to enable FU control. The control mode indicator **FU** and the handle indicator will illuminate on both tillers, meaning that the respective mode is enabled, and that the handles are enabled.

- Release control from INDEP mode
  To allow control handover to another controller, push the button **FU** on one of the two tillers, until control mode indicator **FU** flashes (on both tillers) (this indicates that control handover is allowed).
  NOTE: The tillers stay in control until control is transferred to another controller.
  NOTE: The FU control mode indicator keeps flashing until control is transferred to another controller. There is no timeout. The speaker produces 3 short successive beeps with 10 seconds interval to indicate that the operation is not finished.
  NOTE: The tillers go into standby mode when control is transferred to another controller.

- Release control from SYNC mode
  To allow control handover to another controller, push the button **FU** on the active tiller, until control mode indicator **FU** flashes (this indicates that control handover is allowed).
  NOTE: The FU Tiller S/I stays in control until control is transferred to another controller.
  NOTE: Control mode indicator **FU** keeps flashing until control is transferred to another controller. There is no timeout. The speaker produces 3 short successive beeps with 10 seconds interval to indicate that the operation is not finished.
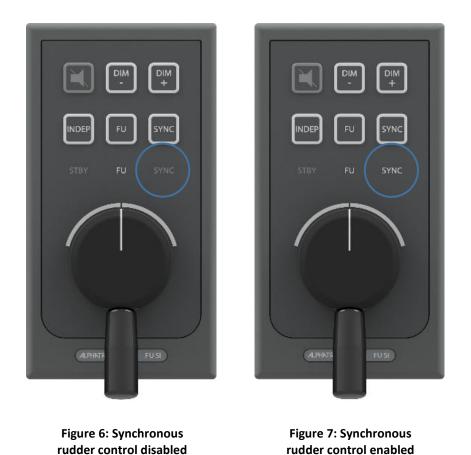 NOTE: The FU Tiller S/I goes into standby mode when control is transferred to another controller.

Enabling/disabling synchronous rudder control

Push the button **SYNC** on one of the two tillers to enable synchronous rudder control. On the active tiller, the control mode indicator **SYNC** will illuminate, and handle indicator stays illuminated, meaning that synchronous rudder control mode is enabled, and that the handle is still enabled. On the other tiller, the control mode indicator **STBY** will illuminate and handle indicator illumination will turn off, meaning that control is disabled, and that the handle is disabled.

Push the button **INDEP** on the active tiller to disable synchronous rudder control. On the active tiller, the control mode indicator **SYNC** illumination will turn off, and handle indicator stays illuminated, meaning that the synchronous rudder control is disabled, and that the handle is still enabled. On the other tiller, the control mode indicator **FU** will illuminate, and handle indicator will illuminate, meaning that control is enabled, and that the handle is enabled.

Figure 6: Synchronous	Figure 7: Synchronous
rudder control disabled	**rudder control enabled**

Steering

In FU control, the steering gear will move the rudder(s) as per FU value command (rudder angle).

Moving the handle to the neutral position will cause the rudder(s) to move to the centre position. Turning the handle farthest to the left will cause the rudder(s) to move to a predefined maximum rudder angle, turning the handle farthest to the right will cause the rudder(s) to move to the predefined maximum rudder angle in the opposite direction.

Alarm handling

The alarm speaker button is only illuminated when there is an internal alarm. When an alarm occurs, the alarm speaker button will flash in an uninterrupted sequence, and the speaker will beep in an uninterrupted sequence.

Figure 8: Alarm active

The alarm speaker can be muted via the alarm speaker button.

When the alarm (is read and) acknowledged on the AlphaPilot MFM control unit, then the illumination will be constant, and the speaker will be muted (if not muted already via the FU Tiller S/I). When the alarm is accepted (e.g. problem solved), then the illumination on the alarm speaker button will turn off.

Dimming

Buttons **DIM -** and **DIM +** are always illuminated (dimmed to a pre-set brightness level) and control is always allowed.

Push the button **DIM -** or **DIM +** to simultaneously adjust the brightness level of all indicators on the FU Tiller S/I and interconnected modules.

Alarm speaker and lamp test

Simultaneously push and hold button **DIM -** and **DIM +** to test the alarm speaker and the indicators; The alarm speaker will beep continuously and all indicators (buttons, control mode indicators, and handle indicator) will illuminate continuously, until the buttons are released.