MANUAL

SIMRAD FU25 and FU50
Steering Levers

20221065E   English

Instruction Manual

This manual is intended as a reference guide for operating and correctly installing the Simrad FU25 and FU50 Follow-up steering levers.

Please take time to read the manual to get a thorough understanding of the follow-up steering lever and its relationship to a complete autopilot system. Make special attention to page 7 regarding in which system the FU25 and FU50 can be used.

Other documentation materials that are provided with your system include a warranty card. This must be filled out by the authorized dealer that performed the installation and mailed in to activate the warranty.

About this document

| Rev. DB	Included the AC05 Autopilot Computer to this manual. Additionally minor corrections to text. This manual covers FU50 software version 1.3.01 and FU25 software version 1.1.01.
Rev. E	New dimensions on FU unit. Dimensional drawing, figure 7-1 updated. New flush mounting kit for upgraded unit added. Spare parts list updated.

Contents

This page is intentionally left blank

1   SYSTEM DESCRIPTION

1.1   General

The FU25 and FU50 Follow-up steering levers feature a dial (scale), with 5° markings. The operator can command a rudder angle by setting the follow-up lever/knob to the wanted angle when in FU mode. The rudder will move and stop at the set angle. The steering lever has a mid-position detent, push buttons for mode selection, and mode indicators STBY, FU, AUTO, NAV, WORK (FU50 only) and THRUST. It is designed for indoor and outdoor bulkhead or panel mount.

A flush mount kit (P/N 20214375) is available as optional extra.
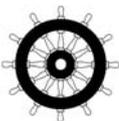
The FU50 is produced and tested in accordance with the European Marine Equipment Directive 96/98 and can be used in a Wheelmark installation. The FU25 is not approved.

Paragraphs marked with the Wheelmark symbol relates only to FU50.

1.2   FU25 Follow-up Steering Lever

The FU25 is intended for autopilot systems using the AC05, AC10, AC20 and AC40 Autopilot Computers.

Note   *FU25 operates on the Robnet2 autopilot network and can not be mixed with other steering levers, such as FU35 and FU50.*

AP25 and AP26 autopilots operate on Robnet2 and have Follow-Up mode implemented. AP16 also operates on Robnet2 but has no Follow-Up mode, however, the FU25 can be used in an AP16 autopilot system.

1.3   FU50 Follow-up Steering Lever

The FU50 is intended for autopilot systems using the J3000X, J300X, J300X-40, J50, and J50-40 junction units.

The FU50 requires a software in the J3xx junction unit that is version V1R6 or higher. Refer to the autopilot manual on how to verify the installed software at turn-on.

In comparison with the predecessor, FU35, please observe the following when using FU50 in AP35 or AP20 autopilot systems:

- The FU50 has got a separate Work indicator (LED) that will lit only in Work mode when operated in an AP35 system

- The Work indicator is not applicable and will not lit in AP20 systems

- The new Thruster (LED) indicator is not applicable and will not lit in AP35 or AP20 systems

Note   *There is a difference between FU50 and FU35 in mode transfers. When taking command in Auto or Work mode, the set course will be maintained when you press the Auto key on FU50. With the FU35, a press on the Auto key will set the actual heading as new course.*

Caution   *With both FU35 and FU50 in the same system please observe the following:*

If you press the Auto key on the FU50 while in a turn in Auto or Work modes, the boat will proceed turning to set course. If you do the same on the FU35, the boat will stop turning and continue on present heading.

2   OPERATION

When operating an autopilot system of multiple control units and steering levers, control is accessible from every control station connected to the system. One station (control unit or FU25/FU50) is "active" and provides the user with access to the respective mode functions. All remaining units are "inactive" and have no effect on course changes.

Note   *In a Wheelmark installation (FU50 only) access must be given from the master control unit.*
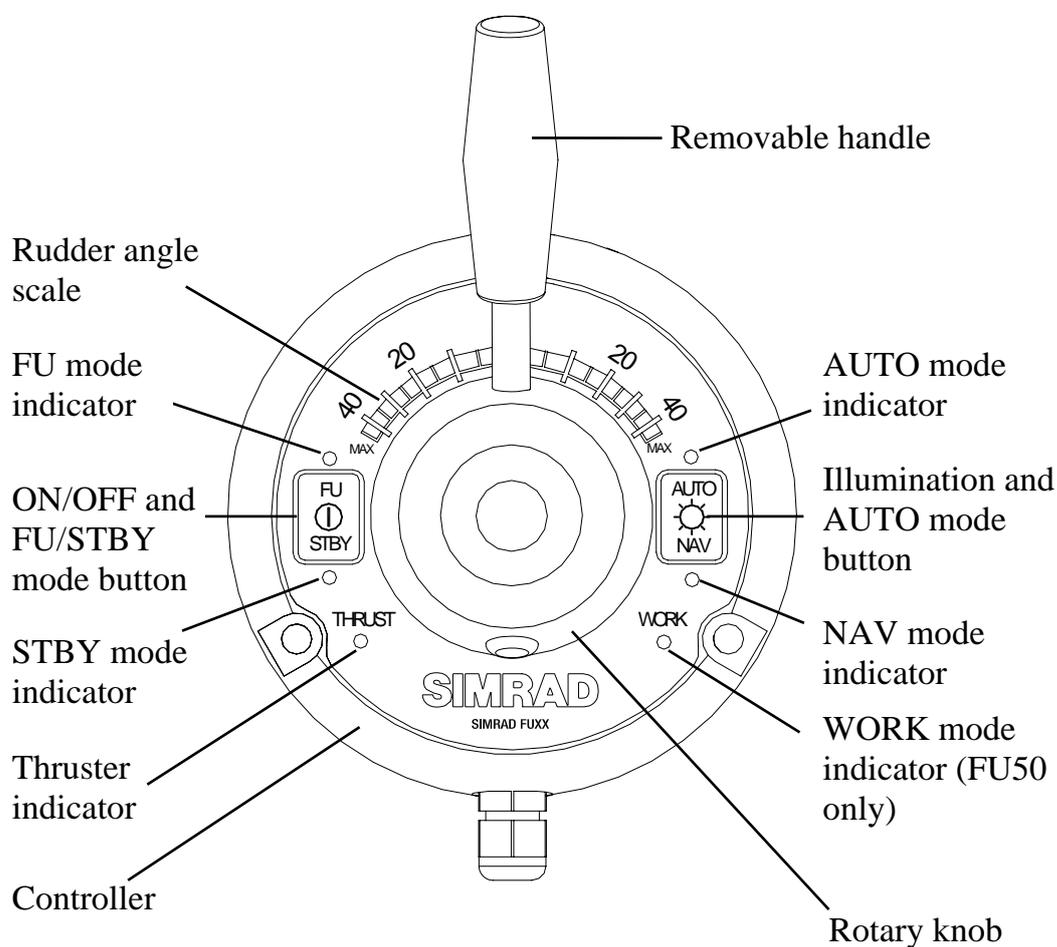
2.1   Power On/Off

It is recommended to turn the system on from a control unit where system status is displayed during start-up (it may also be turned on by pressing the FU/STBY button on the steering lever. The STBY mode indicator is lit at turn-on and the boat can be steered manually by the wheel.

The autopilot is turned off by pressing and holding down the FU/STBY button for approx. three seconds

Note   *In a Wheelmark system the autopilot has to be switched off from the master unit.*

2.2   Inactive Units

On an "inactive" steering lever the mode indicator will pulsate to show the active system mode. A single press on any of the mode buttons on the steering lever will allow transfer of command. The steering lever becomes "active" in that mode as confirmed by a steady mode indicator; e.g. from pulsating STBY mode press AUTO on the steering lever and the system will be in AUTO mode. Refer also to Lock Function, page 14.

2.3   Mode Selection

Press the FU/STBY button to toggle between STANDBY and FU modes. The mode indicator will light correspondingly.

Press the FU/STBY button when in AUTO or NAV mode to select FU mode.

Caution   *Observe the position of the lever (commanded rudder angle) prior to selecting the FU mode.*

Press the AUTO/NAV to select AUTO mode (AUTO indicator is lit). The autopilot automatically selects the current boat heading as the set course.

NAV mode can not be selected from the steering lever. This is a safety feature to avoid hazardous rudder commands. When NAV mode is selected on an autopilot control unit, the NAV mode indicator on the steering lever is pulsating.

Note   *Only on AP35, AP50 and AP51 models.*
When AUTO-WORK or NAV-WORK mode is selected, the WORK indicator on FU50 is lit in addition to the AUTO or NAV indicator.

2.4   Thruster Function
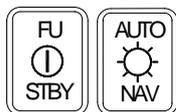
When an AP25 or AP50 autopilot system is connected to a thruster you can select the thruster function from FU25 or FU50.

Press the FU/STBY button and the AUTO/NAV button simultaneously to select thruster function. The thrust indicator will light correspondingly. Switch off the thruster function by a new simultaneous press on the FU/STBY and AUTO/NAV buttons.

When a rudder command is given from the steering lever, the command will also operate the thruster.

In AUTO and NAV modes the thruster cannot be operated from the steering lever. The thrust indicator will however pulsate if the thruster control is enabled from the autopilot control unit.

2.5   FU25 and Volvo Penta IPS system

When the autopilot is connected to a Volvo Penta IPS system, please observe the following:

- If the autopilot display shows "–" instead of "S", you cannot enter any mode from the FU25.

- When the helm is turned on the IPS system, the autopilot automatically switches to STBY mode and displays "–" as long as the helm is being turned.

2.6   Follow-up (FU) Steering

When the FU mode indicator is lit, set the commanded rudder angle by moving the follow-up lever or turning the knob to the wanted rudder angle. The rudder will move and stop at the set angle.
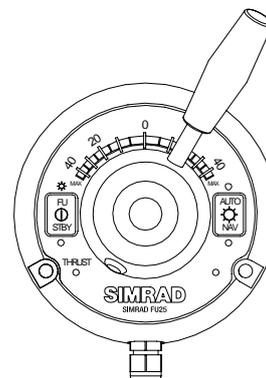
Notes

1. *The maximum obtained rudder angle is 2° less than the maximum angle as set at the rudder feedback calibration in the Dockside menu.*

2. *On AP20, AP21, AP22 and AP35 autopilots, the maximum angle is equal to the Rudder Limit LO (speed) parameter in the Seatrial menu.*

Thruster Control

For AP25 system only:

If a thruster is activated, it will respond when FU commands exceed 10 degrees. There will be no proportional response from the thruster as a function of the commanded angle.

For AP50 system only:

If a continuous/proportional thruster is selected it will push in the same direction as the rotary knob is turned with a force between 0 and max (100%).

If an On/off thruster is activated, it will respond when FU commands exceed 10 degrees.

Note

If the previous TI50 thruster interface model is installed, FU control of an on/off thruster is only possible when the FU50 and the TI50 Thruster interface are equipped with software version V1R2 onwards. Earlier software versions will make the thruster indicator on FU50 pulsate "inactive".
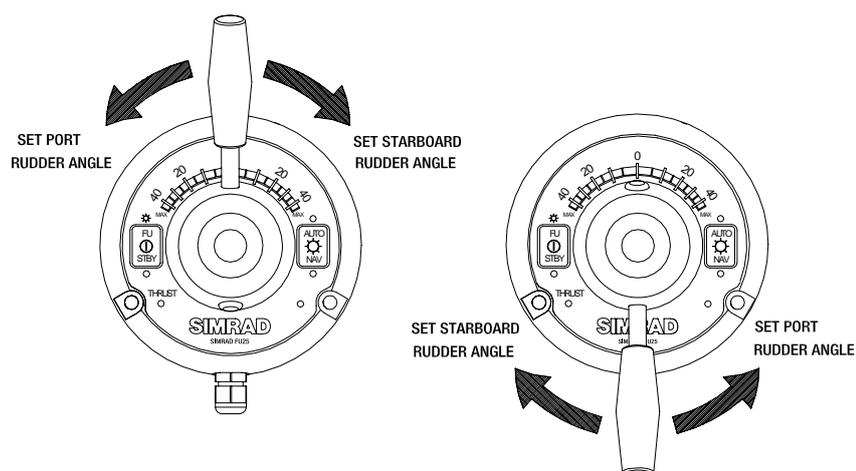
The direction of the commanded rudder depends on where the lever is inserted as shown on the drawing above.

Note

The direction of the port/starboard commands can be turned around by pressing the AUTO/NAV button for 15 seconds. The button light will flash for 1 second. Activate STBY mode before changing the direction.

2.7 Course Change

When operating in AUTO mode, course changes can be made as follows:

Select FU mode and steer the boat on to the new desired course. Then press the AUTO/NAV button again.

2.8 Work Mode on AP35 and AP50 Autopilots

If Work mode is selected on AP35 or AP50 control units, or an AP51 Remote Control, the WORK mode will be retained when the AUTO/NAV button on FU50 is pressed and the WORK indicator is lit.

When alternating between AUTO and FU modes on FU50, the WORK mode is still retained.

The only way to change from AUTO mode to (AUTO-) WORK mode and vice versa is on the AP35/AP50 Control Unit or on the AP51 Remote Contol.

2.9   Nav-, Turn-, Dodge and Wind Modes

With the autopilot active in NAV-, TURN-, DODGE, or WIND (not AP35 and AP50) modes, the active mode will change to ordinary AUTO mode when the AUTO/NAV button is pressed on the Follow-up steering lever.

2.10   Lock Function

The "LOCK" function is a safety feature in the autopilot. In a multistation system it will disable all other control units except for the single, user selected control unit location. The "lock" function can not be activated from the Follow-up steering lever.

When the "lock" function is in use, the "active" control unit stays in command. The steering lever will not respond when the buttons are pressed, only the corresponding mode indicator will pulsate to show the selected mode on the "active" unit.

Note   *Except in a Wheelmark system the autopilot can be turned off on the steering lever even if it is locked: Press the FU/STBY button for more than 3 seconds.*

Lock Function in an AP50 Wheelmark System

At Master operation (Wheelmark) in an AP50 autopilot system, all remotes are locked at power on. A key icon is shown on all remote units with a display.

A quick double press on the master control unit ▣ (STBY) button enables the remote units. This is indicated on the master unit by a flashing crossed key while on the remotes the key icon disappears.

The remote unit that is first activated takes control. If the activated remote unit has a display, the other remotes are locked and units with display show the key icon. If the activated remote unit does not have a display (R3000X, FU50, S35) all remote units can be operated until a unit with display is operated. Then all other remotes are locked.

To reopen the locked remote units, you have to take control from the master control unit, and again make a quick double press on the master control unit ▣ (STBY) button.

System Disengaged (J50 only)

The "System select" (Sys. Sel.) input signal of the J50 (TB14) can be used to alternate between the boat's own steering and the autopilot control system from an external system selector (ref. IMO res. MSC.64 sec. 4).

When the (Sys. Sel.) signal is closed to autopilot Gnd (TB14), the autopilot system will be disconnected from the vessel's own steering system and show "Disengaged" on the display (no mode indicators lit on FU50).

The control has to be regained manually from a control unit or the FU50 Steering Lever.

When the "Sys. Sel." input line is reopened after being closed, the autopilot will go to AUTO mode and the AUTO indicator on FU50 will be lit. In a Wheelmark installation the active unit will now be the master station.

2.11   Illumination

Light intensity of mode indicators can be set to daylight or night level. Press the AUTO/NAV button for more than 3 seconds to toggle between the two levels. Dial and push button illumination is fixed to night level.

2.12   Alarms

Alarm messages are indicated by flashing both mode indicators at the button not showing the present steering mode.

Alarm messages can only be reset from a control unit; carefully read the alarm text first.

If a "Communication failure with JXX or ACXX" is displayed on a control unit, it signals an erratic or no Robnet (bus) input to the unit. The steering lever will then flash the alarm as described above. Refer to the autopilot manual for further information.

If a follow-up command can not be made due to a faulty component (potentiometer) in the steering lever, the "Failure active Control" alarm will be activated and the rudder command "freezes" to the last correct reading.

2.13 Self Test and Calibration

Note   *Under normal circumstances, a self-test should not be necessary.*

Press and hold the AUTO/NAV push button while switching on by pressing the FU/STBY button. This will activate the self test function in the following sequence:

1. FU, STBY, AUTO, NAV, THRUST and WORK (FU50 only) mode indicators are sequentially lit for 2 seconds at high level.

2. All mode indicators are lit for 2 seconds at high level

3. All mode indicators are lit for 2 seconds at low level

4. STBY indicator will light at high level when the commanded angle is within ±1.0° of zero; the remaining mode indicators are off.
   This feature is used to zero adjust the potentiometer after a replacement.

5. Keep the commanded angle at zero and press FU/STBY to set zero command. – The STBY indicator is turned off.

6. To calibrate the scale reading, set commanded angle to 10° stbd. and press FU/STBY when the AUTO indicator is lit. *

7. Set commanded angle to 40° stbd. and press FU/STBY when the AUTO indicator is lit.

8. Set commanded angle to 10° port and press FU/STBY when the FU indicator is lit.

9. Set commanded angle to 40° port and press FU/STBY when the FU indicator is lit.

10. The electronic "watch dog" will restart the unit in the inactive STANDBY mode.

11. Set commanded angle to zero and press one of the mode buttons to proceed to normal operation.

* On FU50s with software version V1R1, the scale reading is calibrated by setting the commanded angle to 30° starboard and 30° port only.

Note   *Calibration can be cancelled by pressing FU/STBY again without setting a commanded angle when the STBY indicator is off as per item 5.*

3 INSTALLATION

3.1 Mounting

The unit is mounted to bulkhead or panel by three Allen screws (2) from the front. See Figure 3-1. The head of the screws may be covered with the three enclosed caps (1).

Note

If the unit replaces an FU25 with product code earlier than EA (AA-DA) or an FU50 with product code earlier than HA (AA-GA), the space between the mounting holes have to be adjusted. Use the unit as a drilling template. See also Figure 7-1 and Figure 7-2.
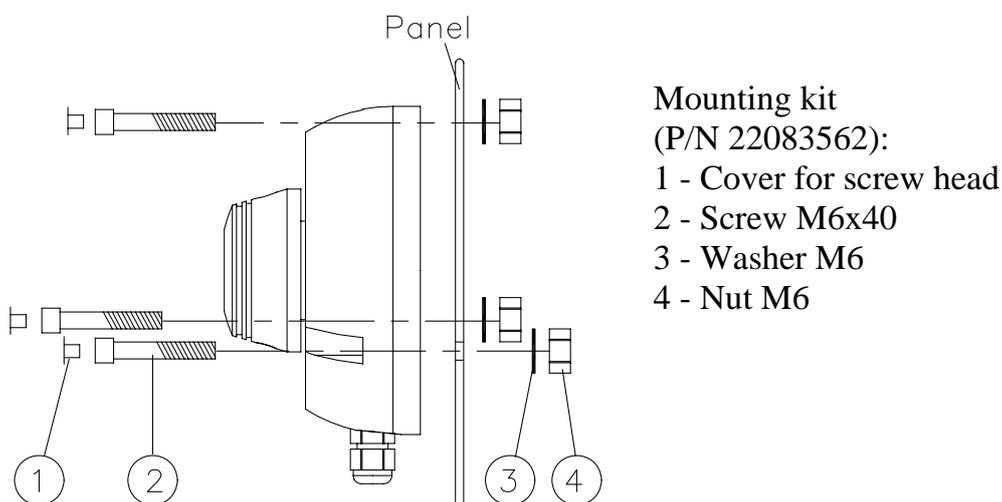

Panel

Mounting kit
(P/N 22083562):
1 - Cover for screw head
2 - Screw M6x40
3 - Washer M6
4 - Nut M6

Figure 3-1 Mounting

The handle can be screwed into the knob pointing upwards or downwards. The knob can also be rotated directly by hand without the handle.

The cable gland can also be mounted in the back cover.

3.2 FU25 connection

The FU25 can be plugged directly into the autopilot control unit or any other device in the system containing a Robnet2 connector. Use a Robnet2 T-joiner P/N 24005662 if necessary.

Alternatively the FU25 can be hard wired to the Autopilot Computer (not AC05). Cut off the plug and strip about 25mm (1') of the cable insulation and pull the shield backwards. Secure

the cable the same way as the other cables in the autopilot computer and connect the wires in parallel with the cable shown on Figure 3-2 using the same color code.
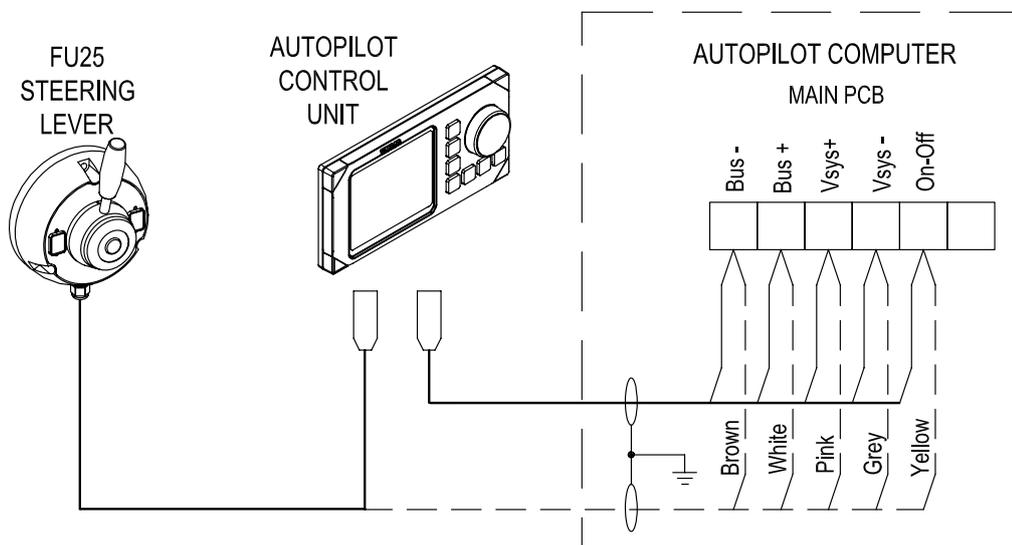

Figure 3-2 FU25 connection to AC10, AC20 and AC40

3.3   FU50 connection

Strip about 25mm (1') of the cable insulation and pull the shield backwards. Secure the cable the same way as the other cables in the junction unit and connect the wires in parallel with the cable shown on Figure 3-3 using the same color code.
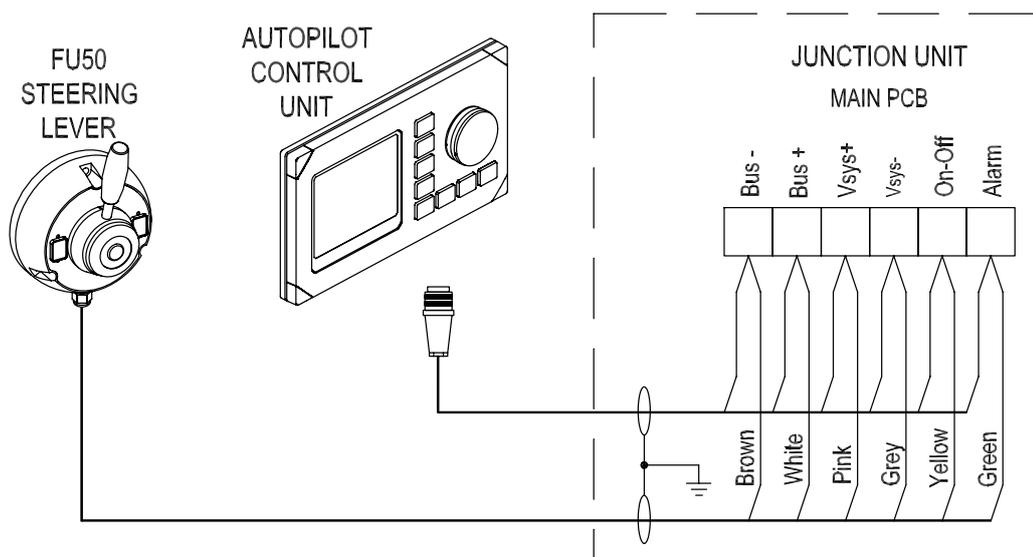

Figure 3-3 FU50 connection

3.4   FU50 in a Wheelmark System

To ensure that a Wheelmark autopilot system can not be switched off from the FU50 Steering Lever (required in a Wheelmark installation), the TB3 terminal block with on/off wires (green/yellow) has to be moved to the not connected (NC) terminal or not connected in the J50 Junction Unit.
See Figure 3-4

3.5   Internal connection

The unit is opened by removing the four screws on the back cover. Inside are a potentiometer and a printed circuit board with plug-in terminals. Internal wire connection is shown on Figure 3-4.
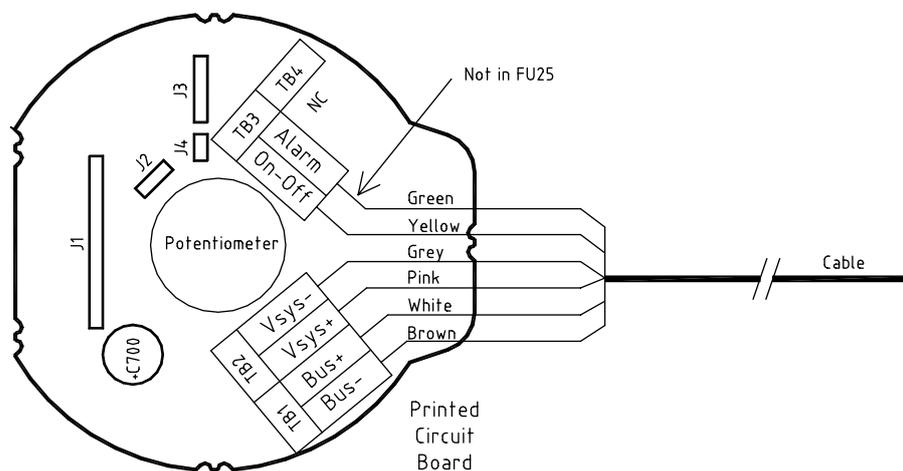
Figure 3-4 FU25/FU50 Internal connections

4   MAINTENANCE

Under normal use, the steering lever will require little maintenance.

If the unit requires any form of cleaning, use fresh water and a mild soap solution (not a detergent). It is important to avoid using chemical cleaners and hydrocarbons such as diesel, petrol, etc.

Make sure that all open Robnet connectors are fitted with a protection cap.

It is advisable at start of each season to check the Robnet connectors and cover with Vaseline or WD40.

5   SERVICE

5.1   How to replace a defective potentiometer

Refer to Figure 6-1.

1. Remove the center cover (1) with the o-ring (2) on top of the steering lever head (7).

2. Loosen the nut (3) a couple of turns. Use a flat screwdriver, min 6, max 10 mm wide.

3. Open the back cover (25) by removing the six 3x10 mm screws (21).

4. Disconnect the potentiometer plug-in cable terminals from the PCB.

5. Remove the four 3x10 mm screws (21) that secure the PCB to the housing and pull out the PCB.

6. Unscrew the M3x10 screw (21) that secures the potentiometer bracket, and pull out the potentiometer with bracket and wires (20).

7. Insert new potentiometer with bracket and wires and assemble the unit following the procedure in reversed order until point 2.

5.2   Zero Point Adjustment

1. The steering lever must be connected to an autopilot system.

2. Enter the "Self test" mode as described in section 2.13. of this manual.

3. Put the steering lever head/lever in mechanical mid position.

4. Insert a flat screwdriver, max 3 mm thick, to the center of steering lever head and adjust the potentiometer for zero indication (light in Stby indicator) as described in the "self test" point 4.

6 SPARE PARTS LIST

20213930		FU25 Follow-up Steering lever with accessories
20214037		FU50 Follow-up Steering lever with accessories
22083562		Mounting kit consisting of:
20212346	7	Rotary knob
20213922	14	FU25 Front panel
20212122	14	FU50 Front panel
20212452	20	Potentiometer (10k) with bracket and wires
20213948	22	FU25 Board ass'y
20212288	22	FU50 Board ass'y
24005647		Cable for FU25, Robnet2, 15m (49')
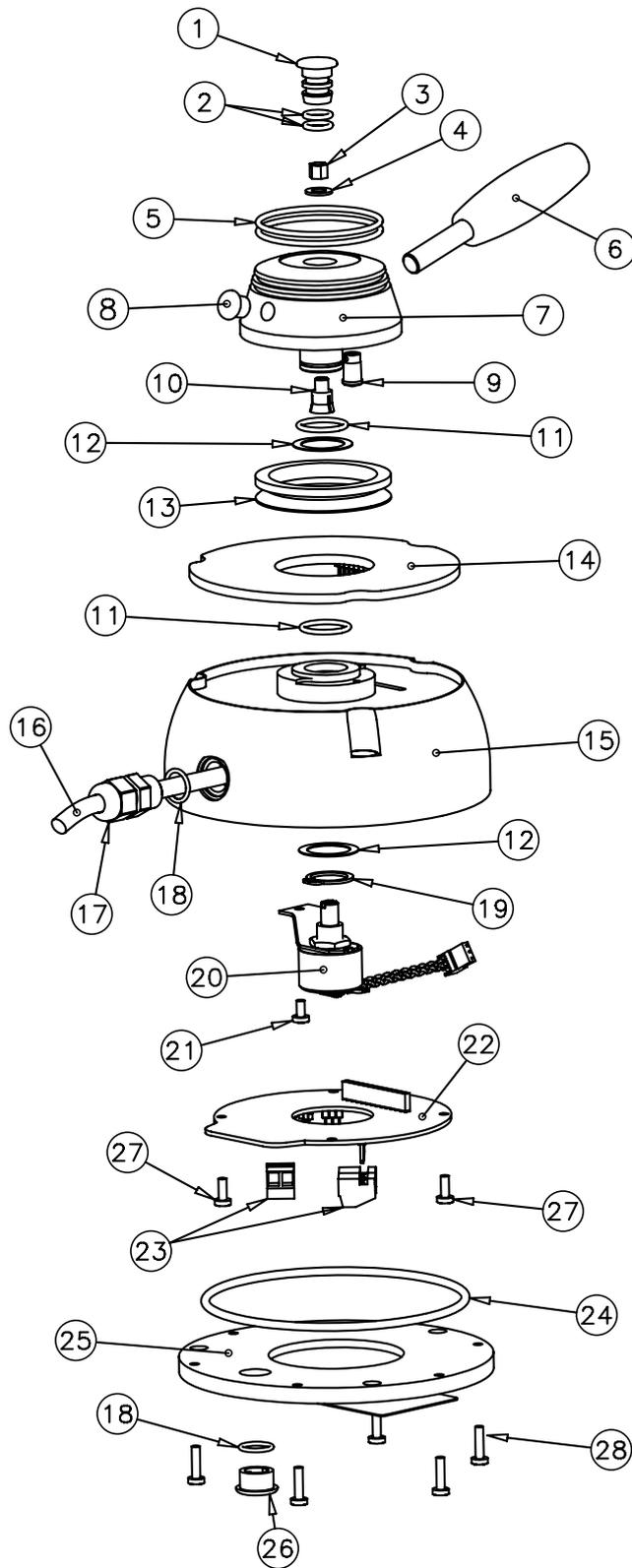
Figure 6-1 Exploded view

7 TECHNICAL SPECIFICATIONS

Dimensions: .... See Figure 7-1.

Handle can be mounted pointing upwards or downwards.

Weight: .... 1.2 kg (2.6 lbs) including cable

Material:..Polyacetal (POM)

Power consumption: 3W

Environmental protection:.. IP56

Compass safe distance:.. 0.15 m (0.5 ft.)

Temperature:

Operating:... −25 to +55°C (−13 to +130°F)

Storage: .... −30 to +70°C (−22 to +158°F)

Cable:

FU25: 15 m (49') Robnet2 cable with connector, containing twisted pairs of wire
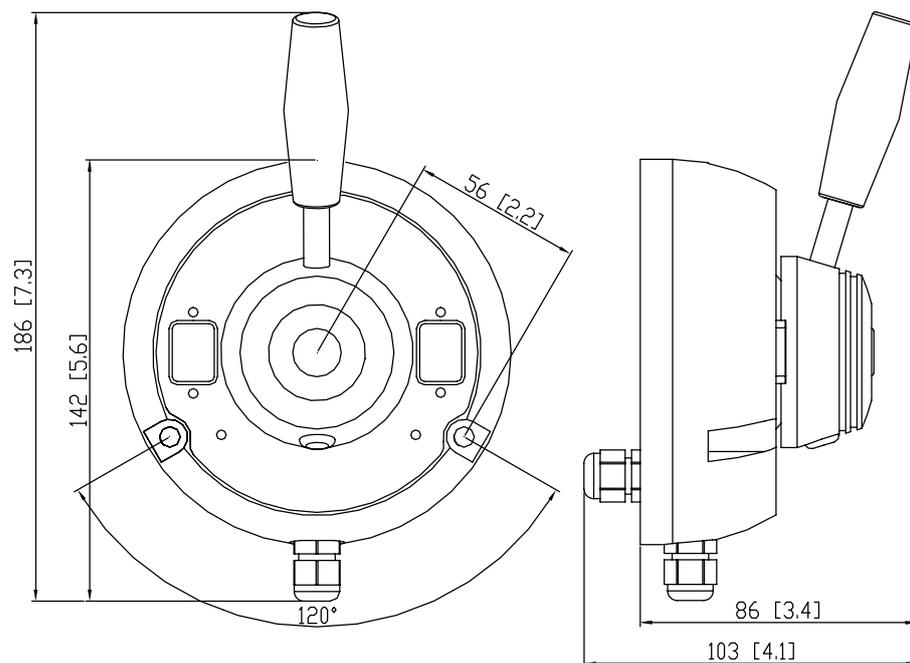
FU50: .... 10 m (33') cable with three (3) twisted pairs of wire

The cable runs through a cable gland. Alternatively the cable gland can be mounted on the back cover (see Figure 7-1).
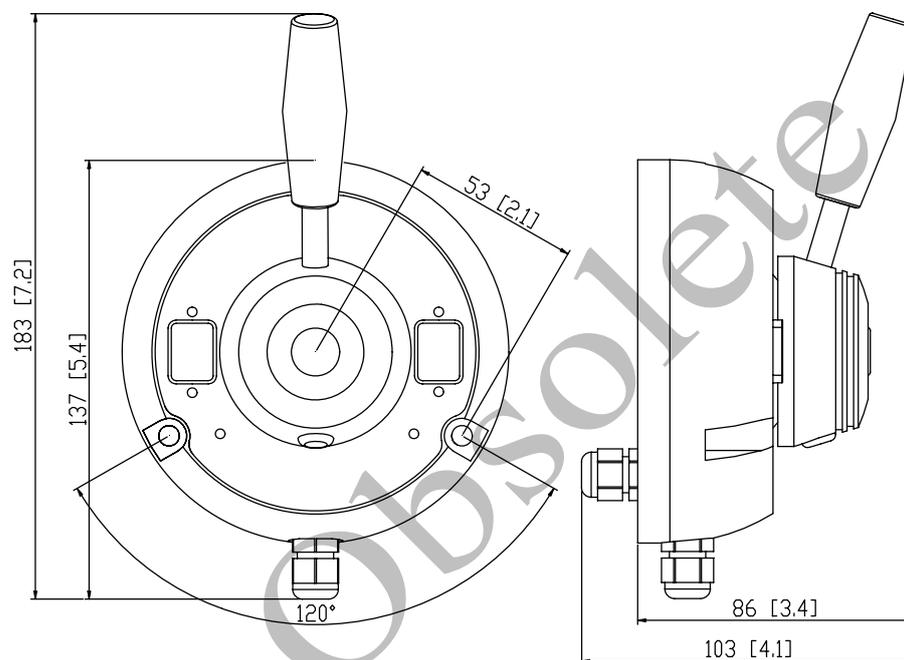
Max. rudder command angle:............................... Equal to physical stop minus 2°

Autopilot interface:... Via proprietary Robnet2 bus (FU25) or Robnet bus (FU50).

Accuracy:.. ±1° within ±40° of mid-position at 25°C.

Figure 7-1 FU25/FU50 Dimensions
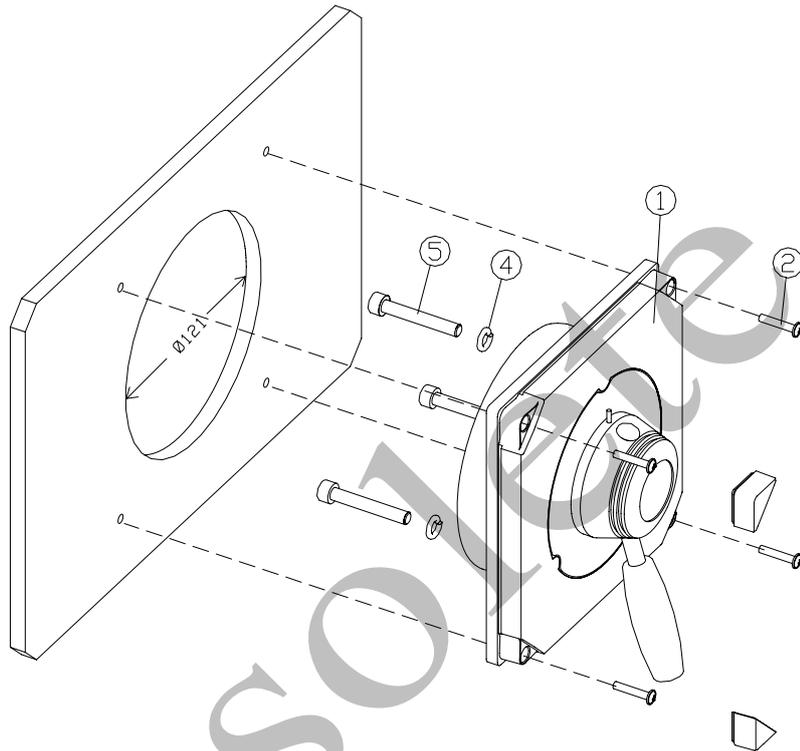*From product code EA (FU25) and HA (FU50) onwards*

Figure 7-2 FU25/FU50 Dimensions
FU25 units with product code earlier than EA (AA-DA) and
FU50 units with product code earlier than HA (AA-GA).

8 APPENDIX

8.1 Flush Mounting Kit, P/N 20213435

For FU25 units with product code earlier than EA (AA-DA) and FU50 units with product code earlier than HA (AA-GA).

Pos	Qty.	Part no.	Description
1	1	20213468	Flush Mounting Panel
2	4	44165181	Screw 3,5x19 mm
3	4	22084529	Cabinet corner
4	3	44150050	Washer M6
	1	20213542	Flush Mounting Template
Supplied with the Steering Lever:			
5	3	44154458	Screw M6x40 mm Hex

Outline dimensions Flush mounting panel:................... 144 x 144 mm (5,7 x 5,7")

Panel cut-out for Steering Lever: .... 121 mm (4,8")

The Flush Mounting Template (P/N 20213542) can be used when the FU50 Flush Mounting Panel is mounted next to an AP50 Control Unit with room for protection cover, or next to an AP50 Control Unit with no protection cover.

8.2   Flush Mounting Kit New, P/N 20214375

For FU25 units with product code from EA onwards and FU50 units with product code from HA onwards.

Note   *This kit is not compatible with the previous model (P/N 20213435). If an FU25 or FU50 with Flush Mounting Kit New, P/N 20214375, replaces the previous model P/N 20213435, the panel cut-out for the steering lever has to be expanded to Ø126 mm (5,0").*
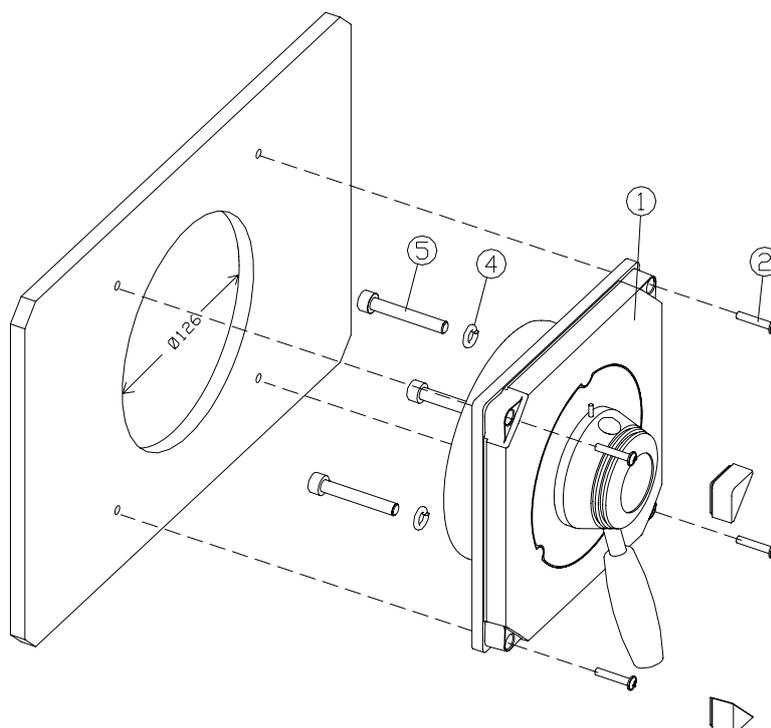
Pos	Qty.	Part no.	Description
1	1	20214383	Flush Mounting Panel
2	4	44165181	Screw 3,5x19 mm
3	4	22084529	Cabinet corner
4	3	44150050	Washer M6
	1	20214391	Flush Mounting Template
Supplied with the Steering Lever:			
5	3	44154458	Screw M6x40 mm Hex

Outline dimensions Flush mounting panel:................... 144 x 144 mm (5,7 x 5,7")

Panel cut-out for Steering Lever: .... 126 mm (5,0")

The Flush Mounting Template (P/N 20214391) can be used when the FU50 Flush Mounting Panel is mounted next to an AP50 Control Unit with room for protection cover, or next to an AP50 Control Unit with no protection cover.