



## Rudder Limitation Unit

### Type 105 - 108

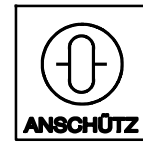
- 1 Description**
- 2 Operating Instructions**
- 3 Installation, First Putting into Operation, Technical Data**

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**Drawings:**

Dimensional Diagram	105 D 108.HP005
Configuration Sheet	105 D 108.HP100

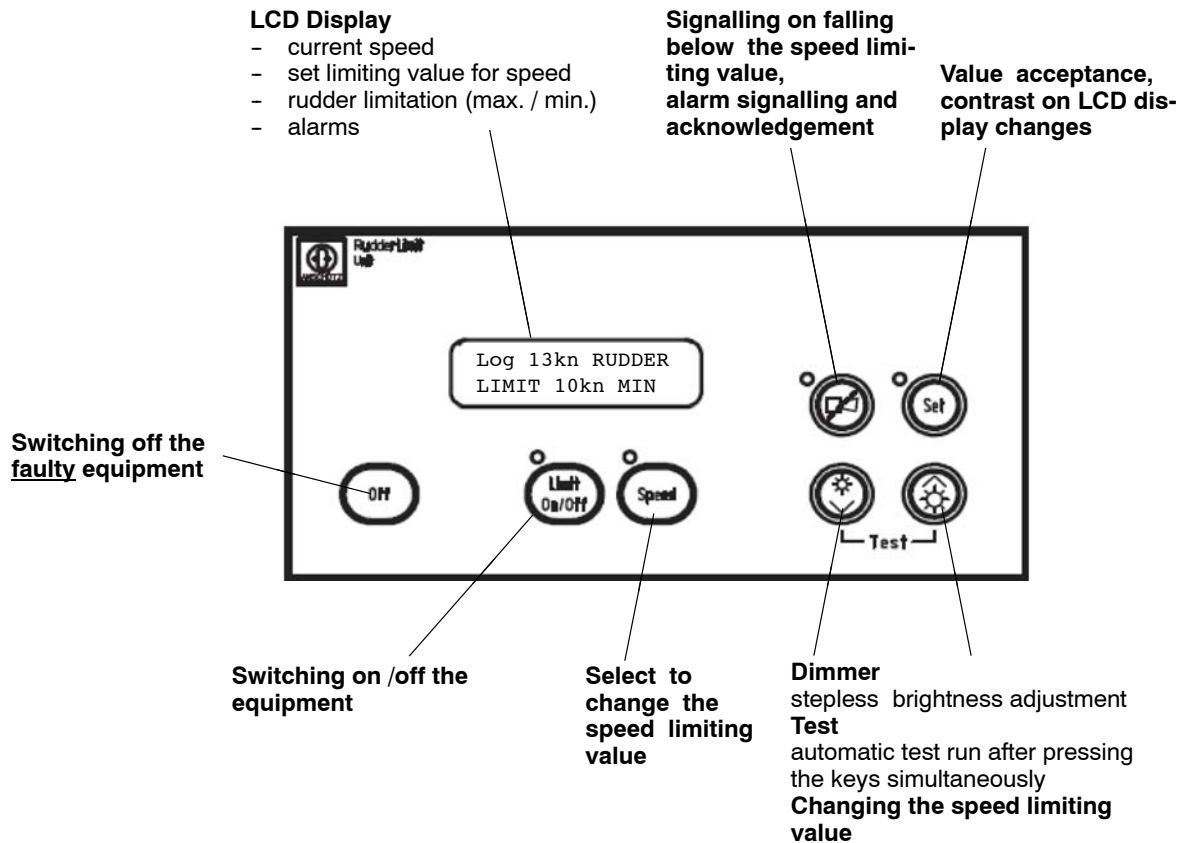
## Rudder Limitation Unit

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1

**Description**

The rudder limitation unit by-passes the limit switch in the feedback unit when the ship's speed falls below a minimal value set at the equipment; the rudder angle is thereby extended to  $\pm 70^\circ$ . The by-pass is cancelled when the minimal speed is exceeded. The limit switch is by-passed by a relay group on a relay PCB; the relays are activated via the operator unit.



**Fig. 1:** Front View of Rudder Limitation Unit

# Rudder Limitation Unit

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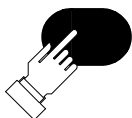
## 2 Operation

### 2.1 Notes on the Instruction Manual

The operation is interactive (action  $\Rightarrow$  reaction).

The operating sequence is explained clearly step by step in the corresponding chapters. Where necessary, helpful information is included in short-form in addition to the figures (symbols).

Explanation of symbols used



pressing a key



action, general



LED *off*



LED *on*



LED *flashes*

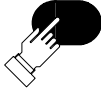
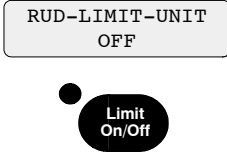




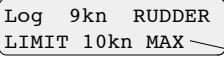
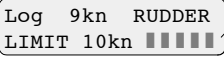




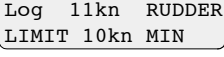





acoustic signal *on*





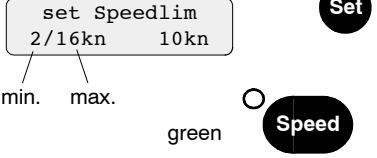



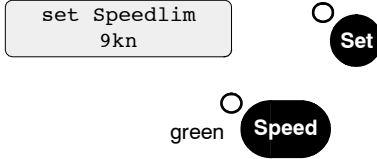

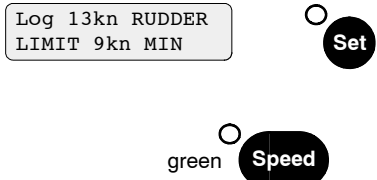
acoustic signal *off*

2.2 Normal Operation

	Indicators	Comment/Notes
<p>1</p>	<p>Equipment switched off</p>	
		<p>Rudder Limitation Unit is not active!</p>
<p>2</p>	<p>Switch on equipment</p>	
	<p>e.g.: </p> <p>green       green </p>	<p>Rudder limitation is now active.                  Display: Display of:</p> <ul style="list-style-type: none"> <li>- current speed</li> <li>- last set limiting value for speed</li> <li>- rudder deflection limited.</li> </ul>
<p>3</p>	<p>Falling below the speed limiting value</p>	
	<p>e.g.: </p> <p></p> <p>green       green </p>	<p>Display: <b>MAX</b> flashes alternately to  until the limitation is once more exceeded.</p> <p> The rudder angle can only be increased manually (handwheel or tiller). As soon as the speed limiting value is once more exceeded, the rudder angles is again automatically limited (refer to 4)</p>
<p>4</p>	<p>Exceeding the speed limiting value</p>	
	<p>e.g.: </p> <p>green       green </p>	<p>Display: Display of:</p> <ul style="list-style-type: none"> <li>- current speed</li> <li>- last set limiting value for speed</li> <li>- rudder deflection limited.</li> </ul> <p> The rudder angle is from now on once more limited by the limit switch in the feedback unit.</p>

## Rudder Limitation Unit




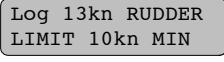
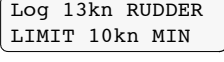
### 2.3 Setting the Speed Limiting Value

	Indicators	Comment/Notes
<b>1</b> Calling up the current speed limiting value		
		<p> <b>Note:</b> The value can not be changed while an alarm is waiting to be acknowledged (Alarm LED flashes red)!</p> <p>The second line shows the the maximum adjustable limit value (min. and max.) on the left, on the right the last set limit value.</p>
<b>2</b> Changing the Value		
  or:		<p>Selecting a new speed limiting value</p> <p>The desired limit value can be changed in steps of 1 kn.</p>
<b>3</b> Accepting a value		
		<p>End the change procedure with the <b>Set</b> key.</p>

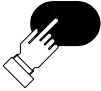

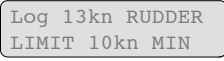
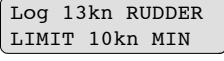


## 2.4 Additional Functions





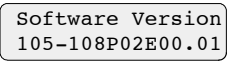
### 2.4.1 Dimming

	Indicators	Comment/Notes
 or: 	e.g.: ⇒  or ⇒ 	stepless change in brightness <ul style="list-style-type: none"> <li>- of the key illumination</li> <li>- of the LEDs (except Alarm LED)</li> <li>- of the background illumination of the LCD display</li> </ul>

### 2.4.2 Changing the Contrast on the LCD Display

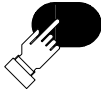


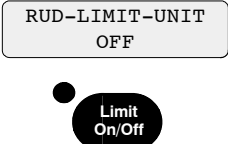
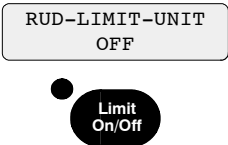
	Indicators	Comment/Notes
	e.g.: ⇒  or ⇒ 	<ol style="list-style-type: none"> <li>1. Press key:                             <ul style="list-style-type: none"> <li>- contrast becomes brighter</li> </ul> </li> <li>2. Press key:                             <ul style="list-style-type: none"> <li>- contrast becomes darker</li> </ul> </li> </ol>

### 2.4.3 Test

	Indicators	Comment/Notes
  Test  simulta- neously during the test run	  e.g.: 	Press the dimmer keys simultaneously and keep them pressed during the test run for approx. 3 s: <ul style="list-style-type: none"> <li>- checks for approx. 5 s                             <ul style="list-style-type: none"> <li>- the LCD segments</li> <li>- the brightest LEDs</li> <li>- the brightest keys</li> <li>- the acoustic alarm</li> </ul> </li> </ul> Then: Displays the current software version.





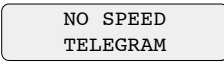
## Rudder Limitation Unit

### 2.5 Switching off the Rudder Limitation




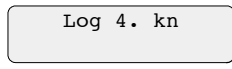
	Indicators	Comment/Notes
 or: 	<div style="text-align: center;">     </div>	<p>Rudder Limitation Unit is no longer active! Normal switch-off</p> <p>Switch-off with the <b>Off</b> key only when equipment is faulty!</p>

## 2.6 Faulty Operation

### 2.6.1 Procedure on Activation of an Alarm

- alarm is activated   and 
  
- acknowledge alarm with  (acoustic alarm goes off, LED lights permanently)
  
- fault indication in display, e.g.: 

### 2.6.2 Overview of Alarms

Cons. No.	Alarm Indication	Possible Cause(s)	Measures
1	   Note: As a serial log can be temporarily suspended, the alarm only sounds here approx. 100s after the log fails!	1.1 Log is not switched on 1.2 Log is defective  1.3 Position receiver is not switched on 1.4 Position receiver is defective	1.1.1 Switch on the log 1.2.1 Make log ready for operation (refer to manual 'Log')  1.3.1 Switch on position receiver 1.4.1 Make position receiver ready for operation (refer to manual 'Position Receiver')
2		2.1 Connection between unit and relay PCBs is defective	2.1.1 Check wiring between unit and relay PCBs
3		3.1 Too many decimal places	3.1.1 Set number of decimal places to „one“ 3.1.2 Change to Pulse Log signal

## Rudder Limitation Unit

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### 3 Installation and First Putting into Operation

#### 3.1 Installation

For the drilling scheme of the desk mounting, refer to dimensional diagram 105 D 108.HP005.

Connecting the rudder limitation unit to a steering gear system:

Refer to the appropriate cable and connection diagrams for the entire system (refer also to Fig. 2: Connection Plan)

**CAUTION:** NMEA speed telegrams are accepted only with one decimal place (0.1kn precision). Alternatively speed information has to be provided as pulse log signal.

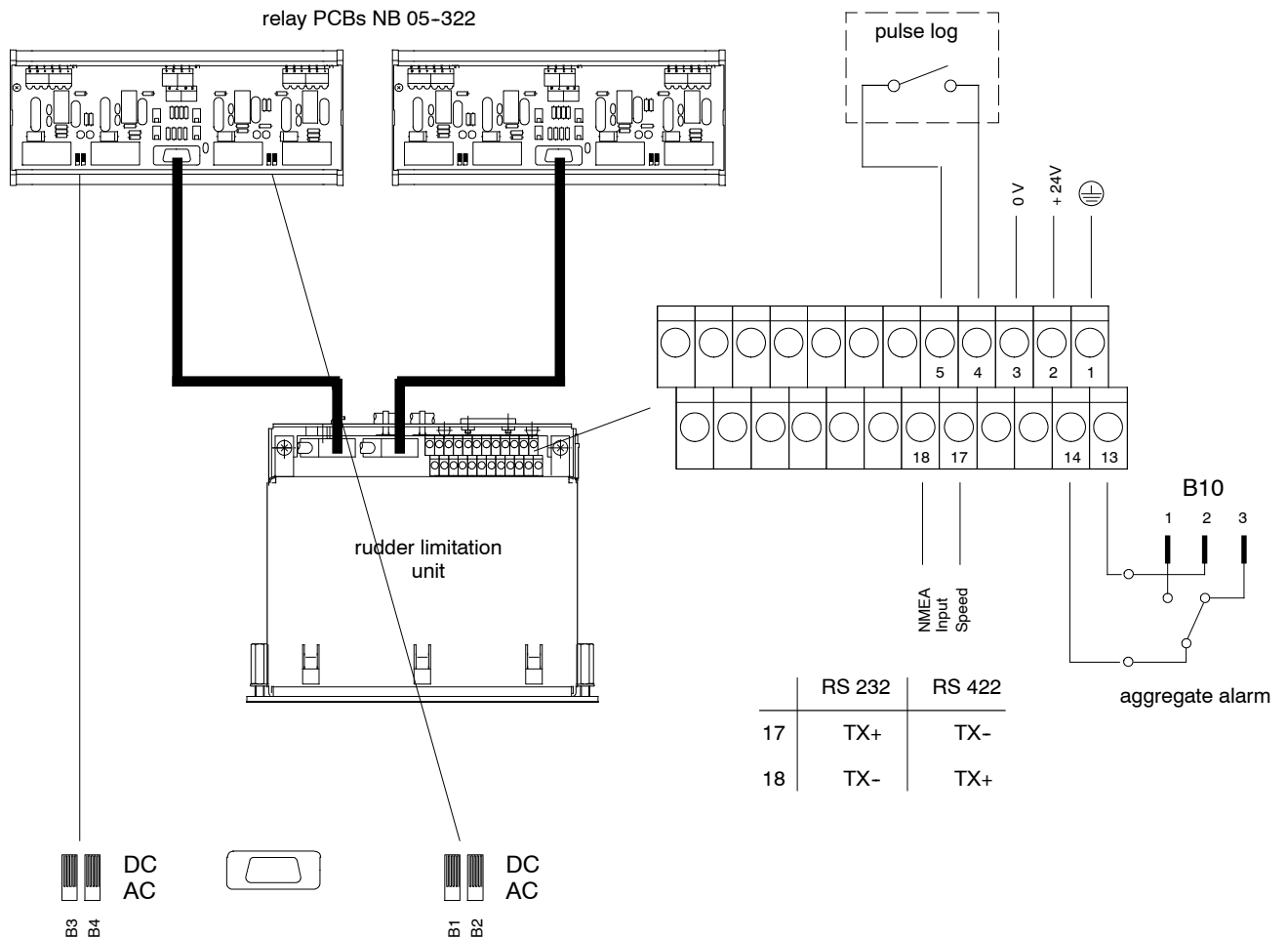



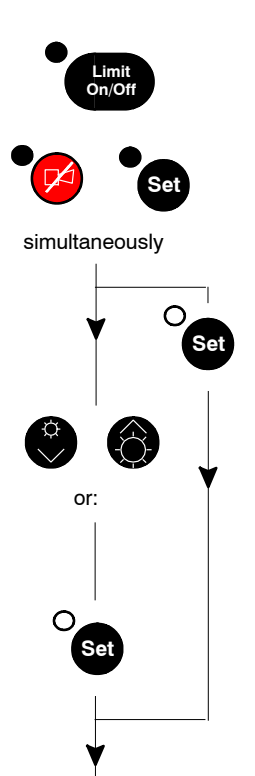





Fig. 2: Connection Plan

## Rudder Limitation Unit

### 3.2 First Putting into Operation

#### 3.2.1 Interface Configuration

To ensure correct operation, the interface configurations for the speed measuring equipment (log) must be set at the rudder limitation unit.

	Indicators	Comment/Notes
 <p>The diagram illustrates the sequence of button presses for configuration. It starts with the 'Limit On/Off' button (with a red 'X' icon) and the 'Set' button. These are pressed simultaneously. Then, the 'Source of Speed PULSE LOG' button is pressed, followed by the 'Set' button. Alternatively, the 'Source of Speed NMEA' button is pressed, followed by the 'Set' button. Finally, the 'RUD-LIMIT-UNIT OFF' button is pressed, followed by the 'Set' button, and the 'Limit On/Off' button is pressed again.</p>	<p style="text-align: center;">RUD-LIMIT-UNIT OFF</p> <p style="text-align: center;">green </p> <p style="text-align: center;">Source of Speed PULSE LOG </p> <p style="text-align: center;">Source of Speed PULSE LOG</p> <p style="text-align: center;">Source of Speed NMEA</p> <p style="text-align: center;">RUD-LIMIT-UNIT OFF </p> <p style="text-align: center;">green </p>	<p>The equipment can only be configured when switched off. The rudder limitation is not active!</p> <p>Press  and <b>Set</b> simultaneously</p> <p>Display of the currently selected log</p> <ul style="list-style-type: none"> <li>- Acceptance of the currently displayed log with the <b>Set</b> key or selection of other equipment</li> <li>- Select the other log with one of the dimmer keys <ul style="list-style-type: none"> <li>- Pulse log is selected, 200 pulses / NM</li> <li>- NMEA interface is selected, VHW or VTG Telegramme</li> </ul> </li> <li>- Confirm selection with the <b>Set</b> key</li> </ul> <p>Unit returns to initial condition</p>

#### 3.2.2 Configuration of the Maximum Limit Value for Speed

The maximum limit value for speed can be adjusted via jumper B3 on the basic PCB (see configuration sheet in the annex). Values between 2 and 16 kn can be adjusted in steps of 2 kn.

#### 3.2.3 Technical Data

Measurements:	refer to dimensional drawing 105 D 108.HP005
Weight:	approx. 1.5kg
Power supply:	24 V <sub>DC</sub>
Power consumption:	approx. 5 W
Interface:	NMEA, RS 232 or RS 422
Type of Enclosure:	EN 60529 IP 56 after installation
EMC:	refer to Declaration of Conformity



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#### 4 Maintenance and Repair

The rudder limitation unit neither requires maintenance nor repair; in case of a defect, the entire unit is replaced.

## Rudder Limitation Unit

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