

# ***BASICTURN*** ***Rate of turn / Swing meter***

## ***Installation & User manual***



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**Important!**

**Delivery Terms:** All our deliveries are under the general terms and conditions applicable to the metal and electrical industry, which have been filed with the Clerk of the District Court in The Hague on 21 August 1991. Chamber of Commerce Chamber of Commerce Rotterdam nr 182635.

**Warranty:** 1 year on Alpatron equipment on material and / or workmanship, excluding travel and accommodation and additional sea trials. Unless otherwise agreed.

**CAUTION!**

**DO NOT** modify this equipment in any way obtaining a written permission from ALPHATRON MARINE otherwise you will void the warranty.

**CAUTION!**

This product is only to be installed and serviced by a certified company either approved by ALPHATRON MARINE or by one of its distributors, otherwise it will void the warranty. This product must be installed according to the prescribed installation methods in this manual, otherwise it will void the warranty.

**CAUTION!**

Basicline instruments contain no operator serviceable parts. Service and repair of both units shall only be done by trained and certified personal

**CAUTION!**

Never use the test rate of turn function during navigation, if the pilot mode is set to on.

**CAUTION!**

The gyro sensor is an sensitive piece of fine mechanics and electronics. Care should be taken during transport against mechanical damage.

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Although this guide is composed with the utmost care, Alpatron accepts no liability for the consequences of any inaccuracies occurring.



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## 1 REVISION HISTORY

Revision number	Description	Date
V1.0	first draft	30-12-2014



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## 2 INTRODUCTION

The BASICTURN is one of the products from the Basicline. The BASICTURN is an rate of turn (swing meter) system, which has been specially developed for inland shipping to show vessels the actual rate of turn value. Combined with the ALPHAPILOT, the BASICTURN forms the ideal autopilot combination for inland shipping. The BASICTURN has one galvanic separated signal output which can be connected for instance to the subsidiary turn indicator in the radar. The BASICTURN also has one output for the autopilot. Apart from that, the BASICTURN has an alarm output indicating whether the turn indicator is in alarm mode or not. The BASICTURN complies with the demands set for RHINE shipping and has been approved under number no. R-4-094.

### 2.1 Options

As an option, the following items are available:

- Manual damping unit, for connection to an river pilot
- Slave indicator unit

### 2.2 VERSIONS

The BASICTURN is available in three different versions. For extreme large convoys the 30 °/min model is the best solution, for larger vessels the 90 °/min model is most suitable, for smaller vessels a 300 °/min is available.

### 2.3 CLASSIFICATION

All parts of the Basicturn are suitable for use in dry rooms



### 3 INSTALLATION

#### 3.1 Supplied parts

The BASICTURN hardware consists of the following parts:

- BASICTURN indicator, including bracket for desktop mounting
- Single Axis Gyro (sensor)
- Installation & User manual

#### 3.2 Position the BASICTURN indicator

The BASICTURN can be mounted as an desktop instrument. For flush mounting, an special flush mounting bracket is needed. The minimum distance between the BASICTURN indicator and an compass is 1,5 meter. The indictor should be installed within the viewing distance of the helmsman. If the unit will be used in conjunction with an autopilot or radar the location should be in the same area. The suggested position is over the radar monitor. The mounting location should be where there is a minimum of vibration and out of direct sunlight. Avoid mounting the unit close of the other sources of heat.

#### 3.3 Position the BASICTURN sensor

The gyro unit is built into a metal housing which has three shock mounts attached to a mounting plate. Check the following instructions for correct installation:

- Position of the gyro as near to the waterline as possible.
- Position the gyro as near to the center line of the hull as possible.
- Place the gyro, horizontally, at a stable platform, try to avoid installation in the column of,- or in the lifting wheelhouse.
- The mounting location should as much as possible vibration free.
- Don't install the gyro sensor on a location with big differences in temperature.
- The arrow on the gyro sensor housing needs to be placed parallel to the length direction of the ship.
- Install the gyro housing on the supplied shock absorbers. Avoid contact with oil and grease.
- Note that the top of the gyro housing needs at least 10 cm of free space above to be able to be dismantled. In general should the sensor be installed on an easy accessible location.

#### 3.4 Other needed materials

Besides the materials in the scope of supply a functional single axis gyro system comprises of:

- Various shielded cables (check the connection diagram)
- Fuse box and fuses

#### 3.5 Cable installation:

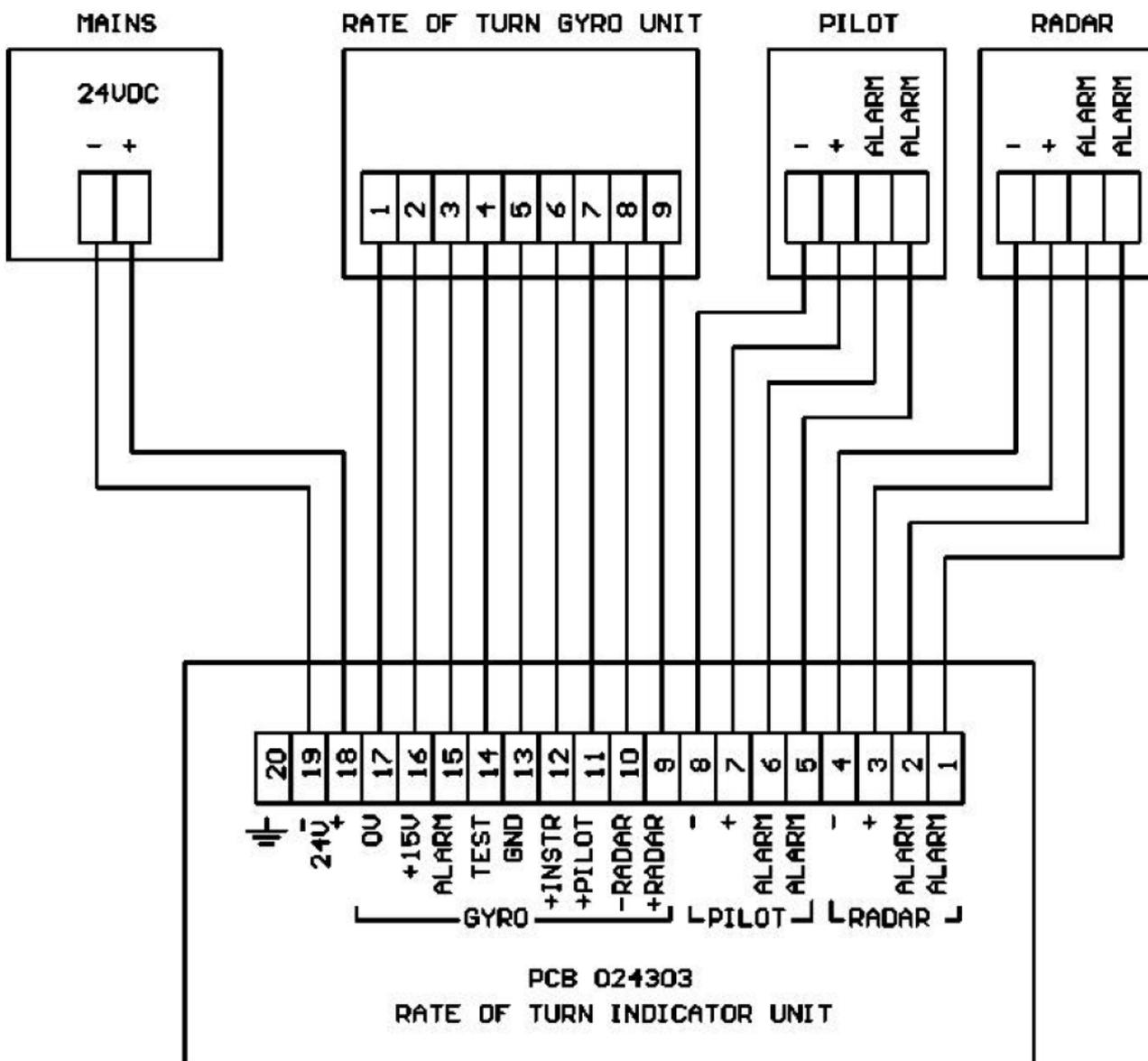
Check the cable diagram for proper cable installation. When no other specifics are known use cables with a minimum thickness of 0,5mm<sup>2</sup>. Cables need to be shielded and will have a flexible core.

Always try to avoid laying cables over long stretches nearby other high power (high current) cables.



### 3.6 Connecting the BASICTURN

The basic configuration of the BASICTURN consist of an indicator and a rate of turn sensor. It is also possible to connect an radar and an river pilot to the BASICTURN. The BASICTURN need to be installed according to the below connection diagram.





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### **3.7 Grounding:**

All hardware parts of this system need to be grounded. Make sure to ground the shield of the used cables on both ends too, also connect the non-used cable wires (on just one end) to ground. The hardware needs to be grounded to the ship's hull using at least a 2,5mm<sup>2</sup> wire. This need to be done using the shortest possible length of the wire from the unit to the hull.

### **3.8 Connecting power:**

The BASICTURN needs to be connected to a power supply, of 20VDC to 31VDC, capable of delivering at least 6 Ah.

### **3.9 Commissioning.**

The BASICTURN doesn't need any extra commissioning after installation.



## 4 CONTROLLING THE BASICTURN

This section explains how the BASICTURN is operated.

### 4.1 Switching the BASICTURN on

In order to switch on the BASICTURN the "on/off" button needs to be pressed shortly. The instrument will switch on immediately. The instrument lighting illuminates and the gyro sensor begins to spin. Until the gyro has reached its operation RPM the red warning lamp which is located over the "test" button is illuminated. When the warning lamp extinguishes the rate of turn indicator is ready for operation.

### 4.2 Switching the BASICTURN off

In order to switch off the BASICTURN the "on/off" button needs to be pressed longer. The instrument will switch off automatically. The gyro will stop spinning in about 1 minute after switching off the system.

### 4.3 Test function

Keep the "test" button pressed to test the gyro system. As long as the "test" button is pressed, the system remains into the test mode. The indicator shows 30°/min starboard reading in the test mode, when the vessel is sailing straight ahead. If the vessel isn't sailing straight ahead, the reading will be + 30°/min to starboard.



#### **CAUTION!**

**Never use the test rate of turn function during navigation, if the pilot mode is set to on.**

### 4.4 Instrument illumination

The illumination of the BASICTURN can be controlled by the control-knob on the front side of the BASICTURN indicator unit. Turning the knob to the clockwise will increase the brightness.

### 4.5 Adjustments after installation

Normally no adjustments after installation is needed. If the indication isn't correct after installation, please check the troubleshooting part in this manual.



## 5 TROUBLESHOOTING



### CAUTION!

When malfunction occurs in the BASICTURN system, the BASICTURN should be disconnected from the autopilot and the steering system on the vessel should be switched over to manual steering until the malfunction is corrected in the BASICTURN system.

#### 5.1 Unit does not start operation after begin switched on

Please check the mains power, fuses and power connection to the BASICTURN indicator.

#### 5.2 No illumination of indicator unit

Defective lamp. The lamp can be changed by first removing the clear cover over the push buttons and the removal of the information plate. Lamp type is miniature bulb 12V 0,48W with mounting type T4,5.

#### 5.3 Red warning light does not extinguish

The gyro sensor has not the correct RPM, can be caused by:

- ❑ After a long period of non-operation the gyro motor require a period of up to 3 minutes to reach the required RPM's.
- ❑ If the cable length between the display and gyro unit exceeds the maximum length, it may take an longer time before the required RPM will be reached.
- ❑ If the temperature is below 0°C the gyro motor require a period of up to 3 minutes to reach the required RPM's. If the gyro has been at temperatures under -10°C for an extended period, the motor should be slowly warmed up to around 0°C before being put into operation. During this warm up of the gyro, caution must be observed that the cover of the unit cannot be opened due to a possible buildup of condensed water.

#### 5.4 Incorrect indication of the rate of turn value.

If the indication of the system isn't correct, the sensor can be adjusted according to below procedures. During the measurements and adjustments of the gyro system no movement of the gyro unit should be forced. Also the vessels should not move or turn.

- ❑ To set the correct RPM for the gyro sensor an oscilloscope is needed. The Gyro sensor has an RPM of 4.000 (both 30°/min and °90/min). The speed can be set with RV6 in the gyro sensor. On test pin "speed" an square wave form (amplitude 5V) can be observed with an period length of exact 15 milliseconds.
- ❑ To set the zero point of the gyro system, use the following sequence: First adjust RV2 in the gyro sensor to set output 1 (pilot and instrument). Second set RV1 in the gyro sensor to set the output 2 (radar). In both adjustments a maximum tolerance of 10mV or 0,5 °/min must be obtained.
- ❑ To set the amplification an calibrated turn-table or calibrated rate of turn indicator is needed. The amplification is set by RV4 in the gyro unit. The outputs 1 and 2 should have an value of 20mV/°/min. The tolerance is ±10%. This setting should be done on different turning speeds in both directions.
- ❑ If all above settings are set correct, the test function needs adjustment. Keep pressed the test button on the indicator unit and adjust RV3 in the gyro sensor till the indication of the rate of turn is showing 30°/min (for an BASICTURN30 the test indication is 10°/min, for the BASICTURN300 100°/min).



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## 6 MAINTENANCE

### 6.1 Cleaning

Only casual cleaning with a moist cloth is required by the owner. Make sure that water or other fluids cannot come in contact with the (inner) hardware. Strong detergents and/or dissolvent need to be avoided. When used with caution, alcohol can be used to clean the surface of the instruments.

### 6.2 Maintenance on the gyro sensor

No maintenance on the gyro sensor is needed.

### 6.3 Repair

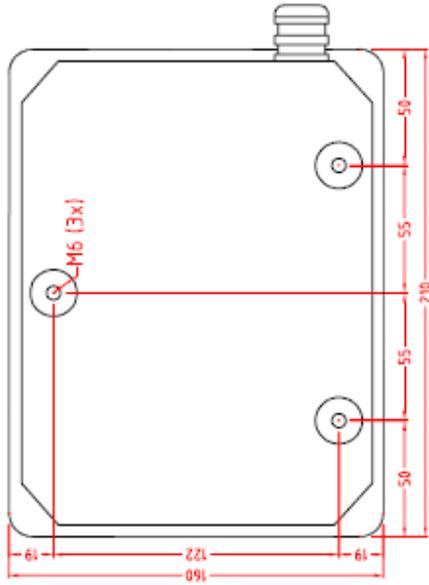
Repairs only may be executed by a certified and authorized service engineer approved by Alpatron Marine BV. Any deviation from this will void your warranty.

**TECHNICAL SPECIFICATIONS BASICTURN**Instrument and sensor:

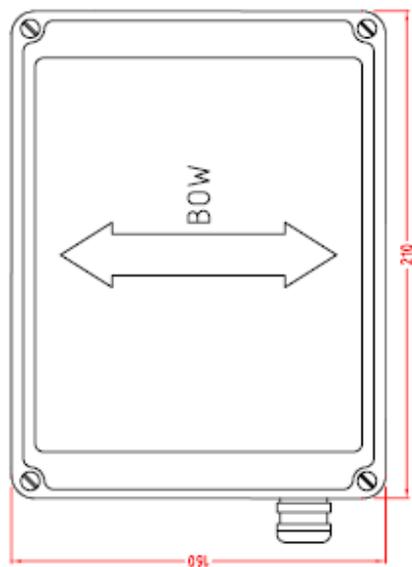
Accuracy	: Hysteresis = 0,1°/min Resolution = 0,1 °/min Zero point = 0,5°/min (0°C to +40°C) Linearity = 5% (0°C to +40°C)
Range	: BASICTURN30 = 30°/min BASICTURN90 = 90°/min BASICTURN300 = 300°/min
Test	: Turning gyro frame by electromechanical enforcement
Alarm	: Optical if RPM error de/increase more than 5%
Gyro speed	: BASICTURN30 and BASICTURN90 = 4.000 RPM
Power supply	: Nominal voltage = 24VDC Voltage range = 20 to 32VDC Current = 1A (during startup 3A, maximum 60 seconds) Protection for inverse polarity Gyro sensor = 15VDC +/- 5%, powered from display unit
Ambient temperature	: Operation = -10°C to +40°C Storage = -20°C to +70°C
Ready for operation	: After about 60 seconds
Outputs	: Output1 - 20mV/°/min isolated - damping time constant (63%): 0,3 seconds limited slew rate 1V/second. Output2 - 20mV/°/min galvanic isolated - damping time constant (63%): 0,3 seconds Alarm - Isolated contact 1A, 30VDC closed at voltage- or speed alarm
IP-rating	: Sensor unit = IP-55 Indicator unit = IP-54
Interference	: According to IEC-945
Compass safe distance	: 1,5 meter
Dimensions	: sensor 206 x 156 x 126 mm Indicator 260 x 160 x 90 mm
Weight	: Sensor = 4 kg Indicator = 3 kg



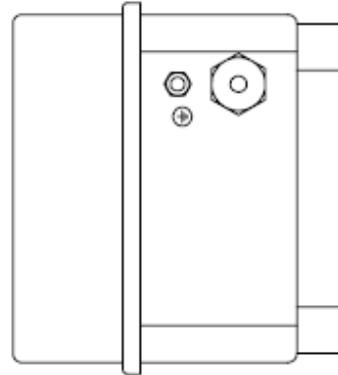
BOTTOM VIEW



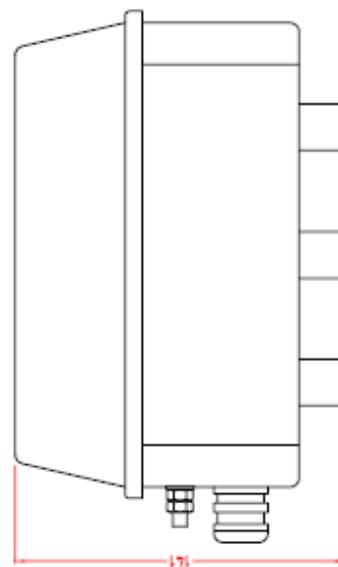
TOP VIEW



REAR VIEW



SIDE VIEW

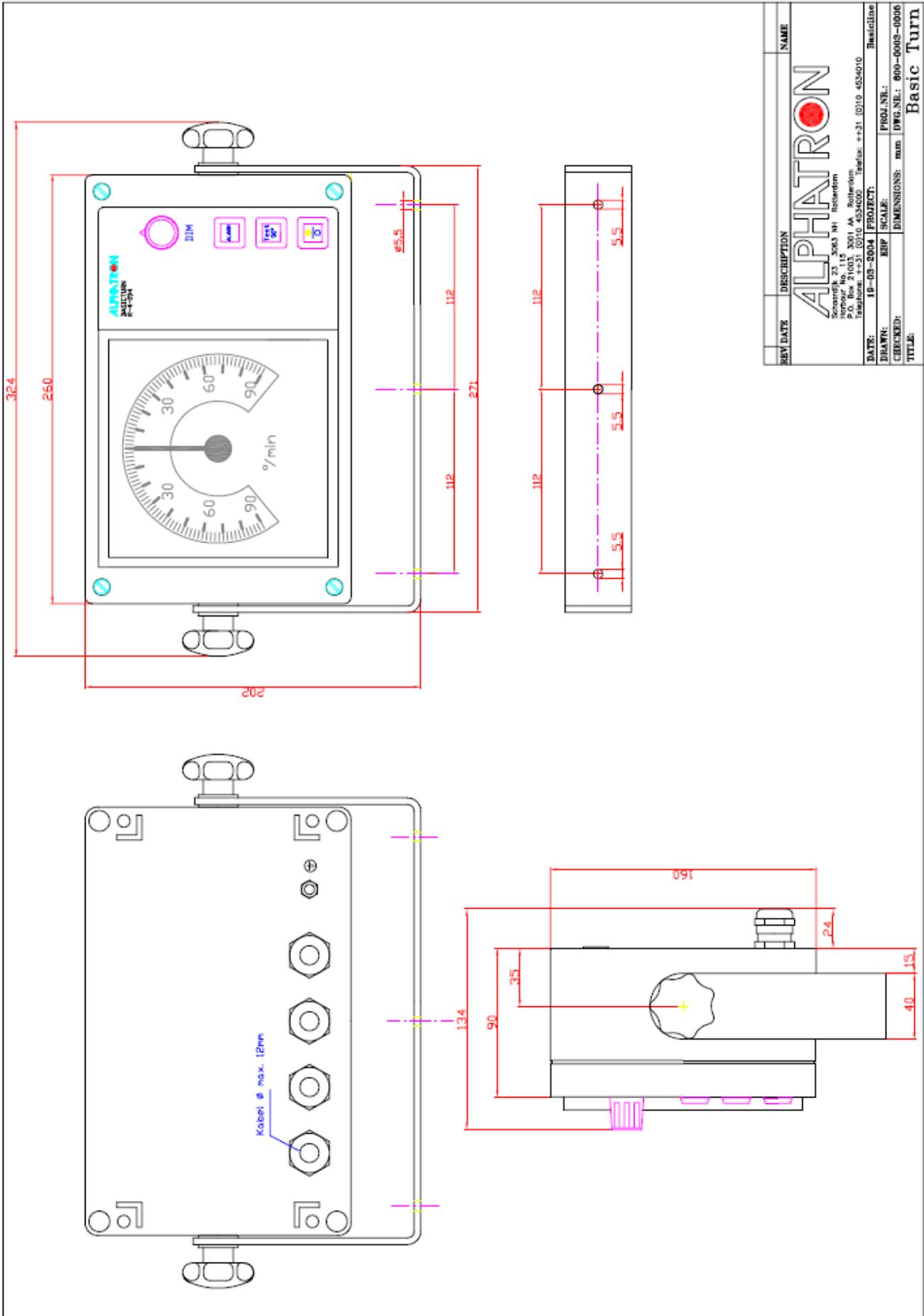


ALPHATURN RATE OF TURN SENSOR

NO.	DESCRIPTION	ORDER'S NAME
1	ALPHATRON	ALPHATRON
R.P. von der Mark Industriestraße 201 44369 Nettetal Telefon: 0170 4320500 Fax: 0170 4321270		
DATE:	87-08-1887	PROJ.NR.: 1:1
DRAWN:	L. de V.	SCALE:
CHECKED:		DIMENSIONS: mm DWG.NR.: 000-0001-0003
TITLE:	Alphaturn Gyrotol	

ABOVE GYROTOL KEEP  
10cm FREE FOR  
OPENING OF THE TOP

Only mounting on horizontal surface



REV	DATE	DESCRIPTION	NAME
			<b>ALPHATRON</b>
		Scourfak 23, 3003 M1 Rotterdam IJmuiden No. 115 2001 M1 Rotterdam IJmuiden No. 115 2001 M1 Rotterdam Telefoon: ++31 (0)10 4334000 Telefax: ++31 (0)10 4334010	
		DATE: 19-08-2004 PROJECT: BIP SCALE: PROJ.NR.: Basicline	
		DRAWN: DIMENSIONS: mm DWG.NR.: 000-0005-0006	
		CHECKED: TITLE: Basic Turn	



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## TECHNICAL SUPPORT

Please contact us when you have questions or are in need of technical support:

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