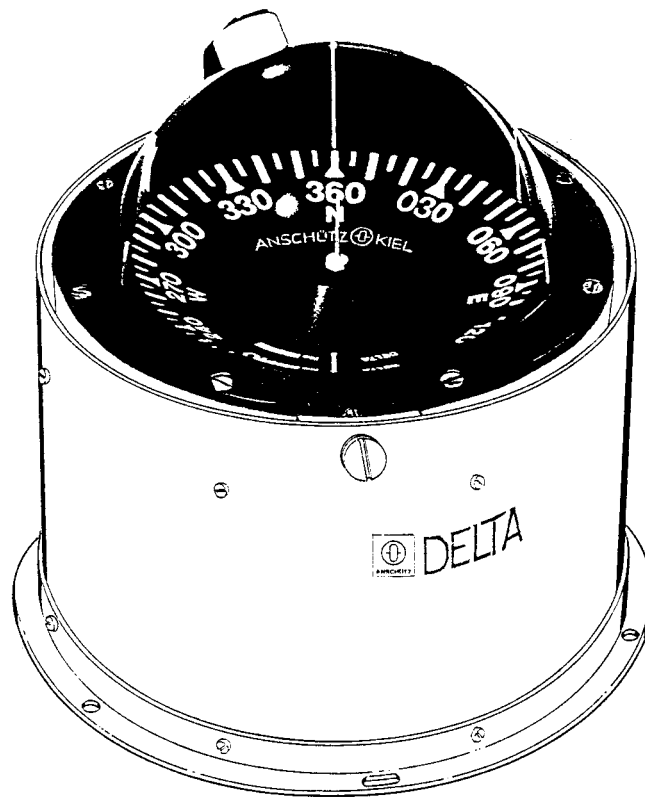


---

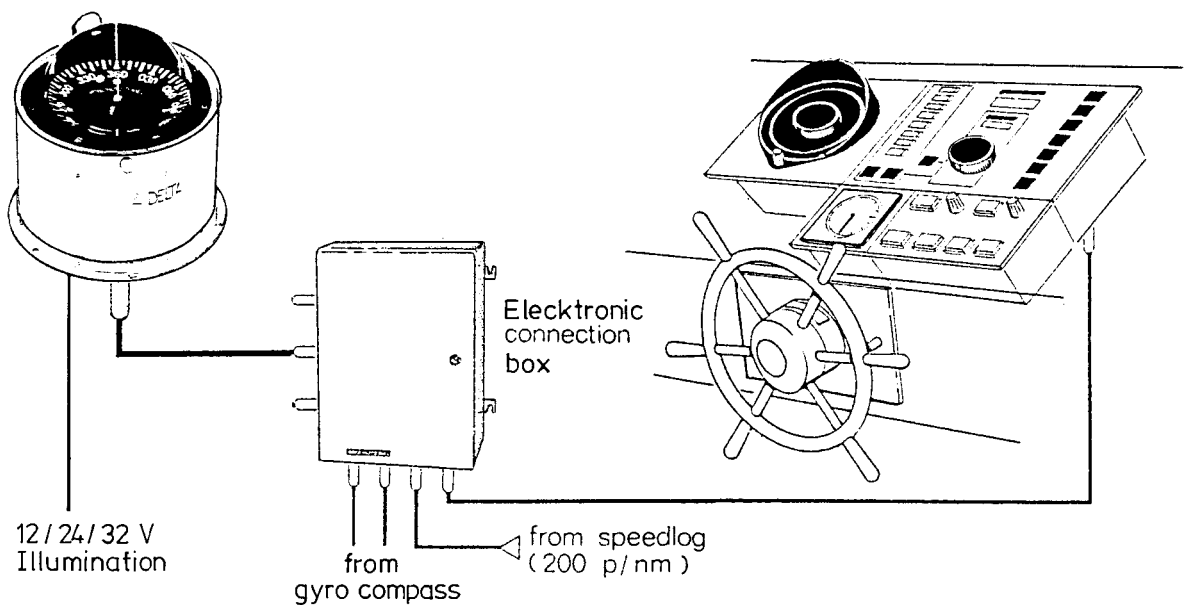
# Spherical Magnetic Compass

## DELTA



The spherical magnetic compass DELTA with the incorporated ANSCHÜTZ magnetic sonde can be used as a course sensor within a navigational system for steering a ship.

Example of System Configuration



*Copying of this document, and giving it to others and the use or communication of the contents thereof, are forbidden without express authority. Offenders are liable to the payment of damages.*

*Weitergabe sowie Vervielfältigung dieser Unterlage, Verwertung und Mitteilung ihres Inhalts nicht gestattet, soweit nicht ausdrücklich zugestanden. Zuwiderhandlungen verpflichten zu Schadensersatz.*

### Design of the Spherical Magnetic Compass (Figure on Page 3)

The real spherical compass is supported by an annular semi-cardanic suspension which is pivoted in the casing; by this means, a high freedom of rotation about the roll axis is ensured.

The compass card in the sphere is connected with an annular magnet and can be turned through  $n \times 360^\circ$ . A liquid included in the sphere permits the oscillations of the card to be damped.

The course can be read off against a lubber line (3) located within the sphere. The lubber line has been designed such as to ensure no-parallax compass course readings.

A fastening flange (5) is screwed onto the annular casing with covering hood (1). The fastening flange can be fixed to the casing at two different places so that the compass can be used as a built-in or built-up version.

The compass card is illuminated (2).

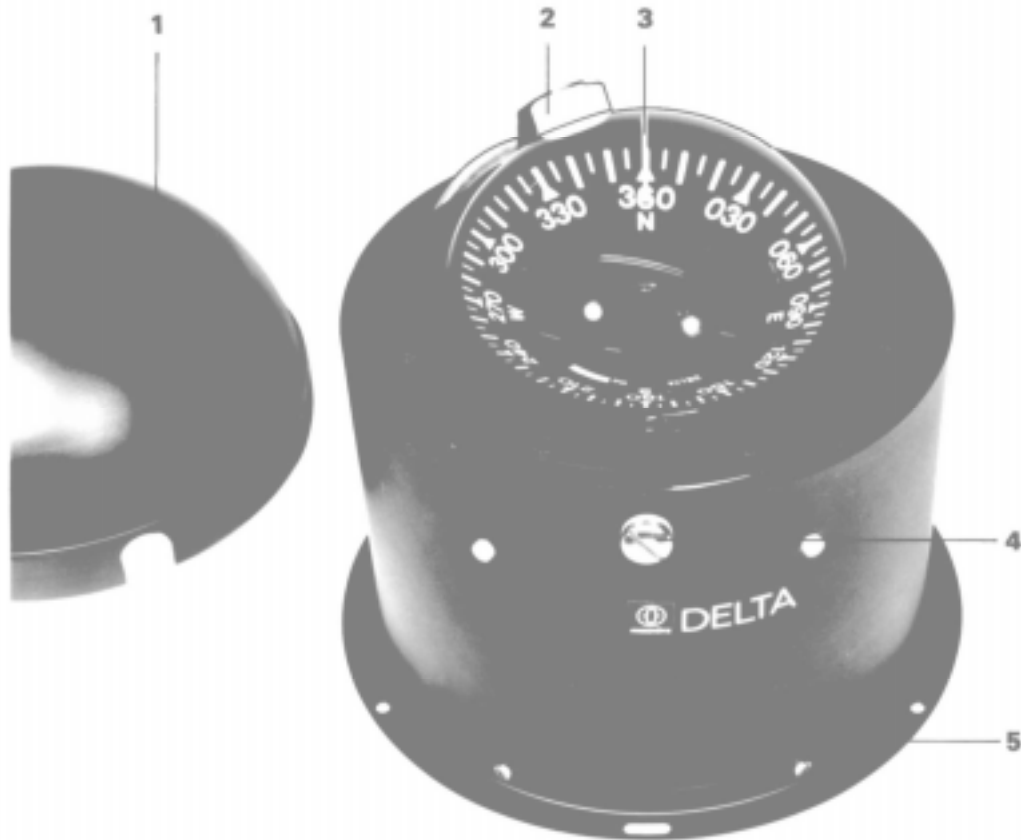
### Design of the Magnetic Sonde (Figure on Page 4)

The ANSCHÜTZ magnetic sonde is fastened in the lower part of the sphere support. It scans off the angular position of the DC magnetic field in the card level of the magnetic compass and converts it into a 3-phase electric signal. This electric signal is used as a course reference for an ANSCHÜTZ autopilot.

The power supply of the magnetic sonde as well as the signal transmission are ensured via a 6-core, screened connecting cable (3).

Within the magnetic sonde (2), a circular PCB is located accommodating an annular magnetic soft-iron core with three coils arranged upon it and displaced by  $120^\circ$  each, as well as three resistors.

All electric components are moisture-proof cast integral in synthetic resin within an aluminium cap.

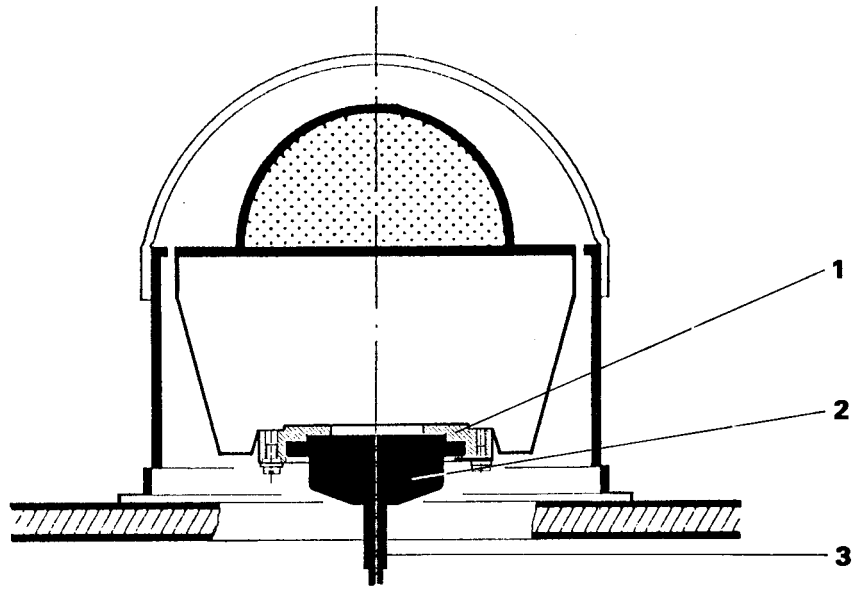


Copied of this document, and giving it to others and the use or control of compasses, are for sale or control without express authority. Offenders are liable to the payment of damages.

Wiedergabe sowie Verwertung dieser Unterlagen, Verweissung und Benutzung eines Teils oder der gesamten Angaben sind ohne schriftliche Genehmigung Anschutz verboten. Zuwiderhandlungen verpflichten zu Schadenersatz.

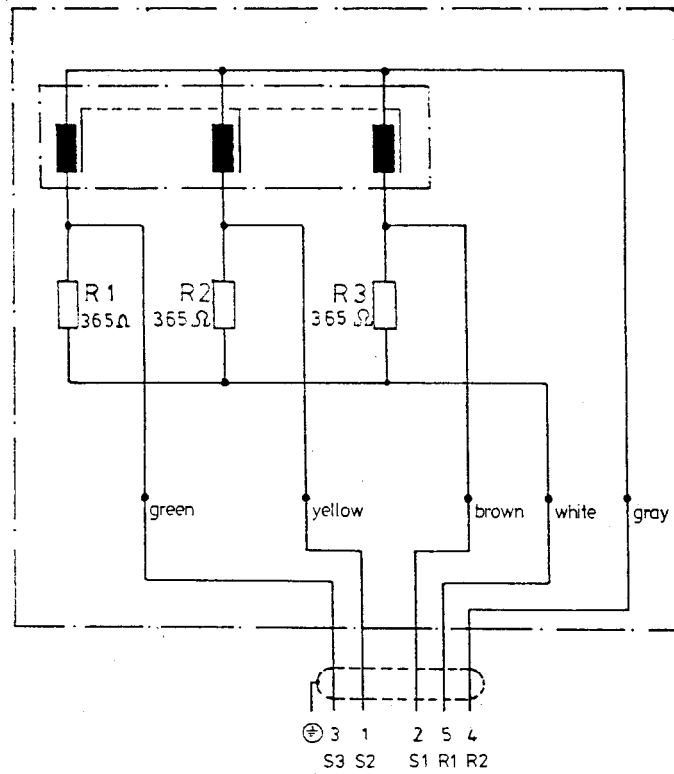
### Spherical Magnetic Compass

- 1 Hood
- 2 Illumination
- 3 Lubber line
- 4 Cardanic suspension (roll axis)
- 5 Fastening flange



Magnetic Compass with Magnetic Sonde

- 1 Sonde holder
- 2 Magnetic sonde
- 3 Cable, 6 cores



Magnetic Sonde - Circuit Diagram

Copying of this document, and giving it to others and the use or communication of the contents thereof, are forbidden without express authority. Offenders are liable to the payment of damages.

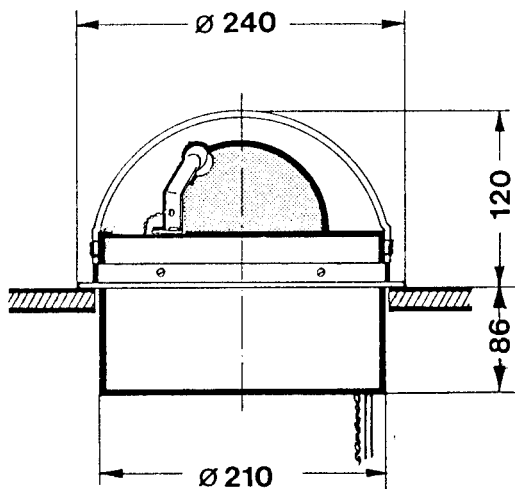
Weitergabe sowie Vervielfältigung dieser Unterlage, Verwertung und Mitteilung ihres Inhalts nicht gestattet, soweit nicht ausdrücklich zugestanden. Zuwiderhandlungen verpflichten zu Schadenersatz.

**Technical Data**

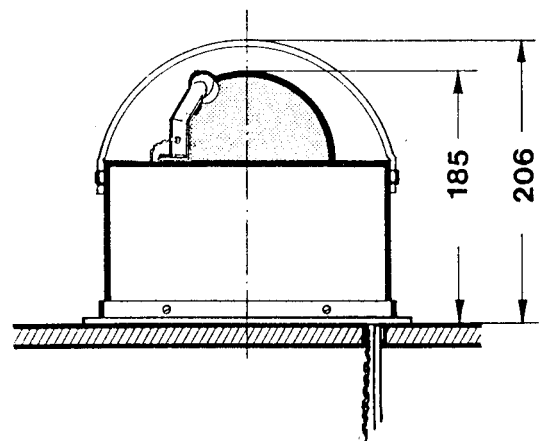
Spherical Compass:

True/apparent card diameter:	100/120 mm
Height over deck (with hood)	
Built-up type:	206 mm
Built-in type:	120 mm
Mounting depth of built-in type:	86 mm
Outer diameter:	210 mm
Magnetic moment:	0.9Am <sup>2</sup>
Half-cycle:	10 s
Friction and directional error:	<0.5 <sup>o</sup>
Freedom of pitch:	+30 <sup>o</sup> (horizontal mounting)
Freedom of roll:	+90 <sup>o</sup>
Supply for illumination:	12/24/32V
Cable length:	
Connecting cable for magnetic sonde	approx. 5 m
Illumination cable	approx. 5 m

Dimensions:



Built-in Version



Built-up Version

Copying of this document, and giving it to others and the  
 use of its contents for other than its intended purpose, are for-  
 bidden without express authority. Offenders are liable to  
 the payment of damages.

Weitergabe sowie Vervielfältigung dieser Unterlage,  
 Vervielfältigung und Verbreitung, auch auszugsweise,  
 sind ohne schriftliche Genehmigung der ANSCHÜTZ  
 sind ausdrücklich untersagt. Zuwiderhand-  
 lungen verpflichten zu Schadensersatz.

Magnetic Sonde:

Weight:	approx. 0.16 kg
Input voltage (excitation):	3.5V ... 4.8V
Input frequency:	approx. 400Hz
Output voltage, max. value, (measured between S1 and S2):	approx. 2.8V
Output frequency:	double exciting <sup>peak-to-peak</sup> frequency
Type of enclosure:	IP 65
DHI test number:	DHI/46/1k/78
Permissible ambient temperature	
- storage:	-40 <sup>o</sup> C ... +70 <sup>o</sup> C
- operation:	-25 <sup>o</sup> C ... +55 <sup>o</sup> C
Magnetic flux density of the magnetic field to be scanned:	0.15mT ... 1.5mT
(most favourable value):	0.5mT
Magnetic moment of magnetic compass:	approx. 3000cgs

Copying of this document, and giving it to others and the  
 use or communication of the contents thereof, are for-  
 bidden without express authority. Offenders are liable to  
 the payment of damages.

Weitergabe sowie Vervielfältigung dieser Unterlage,  
 Verwertung und Mitteilung ihres Inhalts nicht gestattet,  
 soweit nicht ausdrücklich zugestanden. Zuwiderhand-  
 lungen verpflichten zu Schadensersatz.

### Mounting the Compass

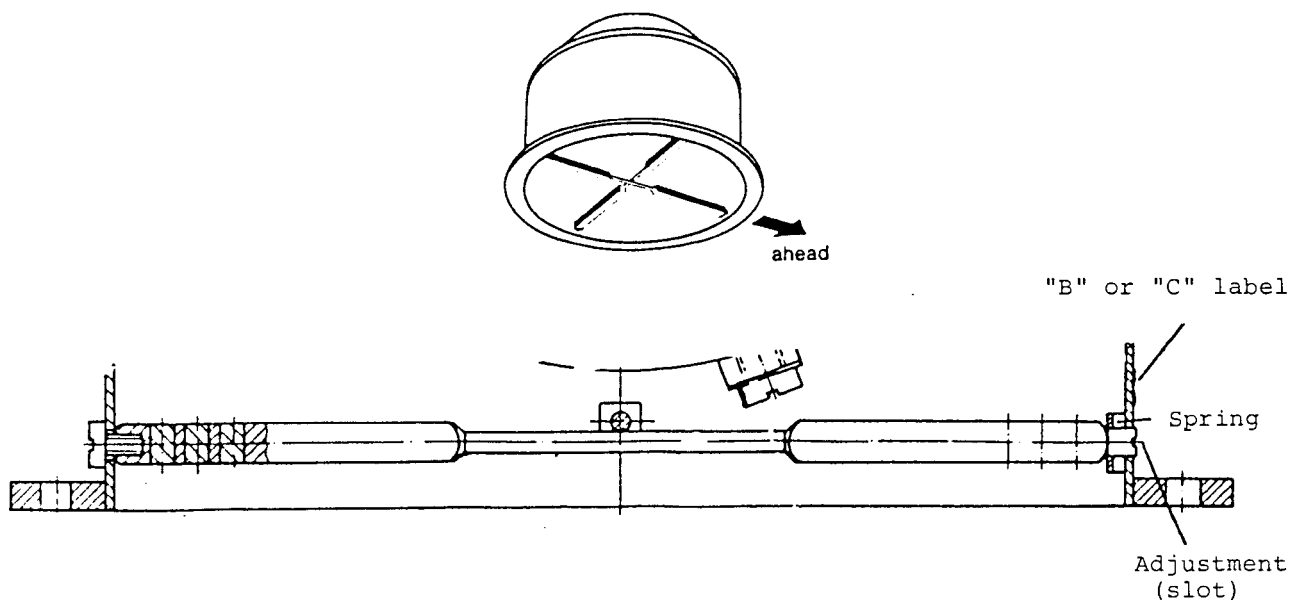
- Remove the fastening flange from the compass and place it on the intended mounting site in such a way that the oblong holes are aligned at right angles to the ship's fore-and-aft line.
- Fasten the flange in the oblong holes.

In case of a built-in-type compass, the deck's opening is additionally to be sawn out. The diameter corresponds to the inner diameter of the fastening flange.

- Place the compass into the flange and fix it to the flange by means of the six attached screws: the upper holes for the built-in version, the lower holes for the built-up version. The lubber line must exactly point in the ship's ahead direction. For correction, use is made of the oblong holes. Subsequently, screw in the remaining screws.

### Mounting the Correctors

Mount the correctors crosswise, as can be seen from the drawing, into the holes provided in the lower part of the compass bowl. The adjusting slot points to port ("C" corrector) and to astern ("B" corrector). In the neutral position, the slots are horizontal.



Copying of this document, and giving it to others and the use or communication of the contents thereof, are forbidden without express authority. Offenders are liable to the payment of damages.

Weitergabe sowie Veröffentlichung dieser Unterlagen, Verbreitung und Mitteilung ihres Inhalts nicht gestattet, soweit nicht ausdrücklich zugestanden. Zuwiderhandlungen verpflichten zu Schadenersatz.



## Maintenance

For maintenance, it is recommended to oil the cardan axle bearings from time to time.

## Replacing the Lamps

Remove the capsule of illumination from below the illumination support. The lamp can simply be pushed into the plug-in socket. The cabling is to be performed acc. to drawing. The magnetic sonde is free from care and maintenance.

Copying of this document, and giving it to others and the  
use of its contents in any form, are for  
the sender's account and liability, and the  
sender is not responsible for any  
damages without express authority. Offenders are liable to  
the payment of damages.

Weitergabe sowie Vervielfältigung dieser Unterlage,  
Verbreitung und Verwertung in jeder Form,  
soweit nicht ausdrücklich zugestanden, Zuwiderhand-  
lungen verpflichten zu Schadensersatz.



SY/MY	Datum/Ort	Eigner				
Deviation Diagram		Deviation Table				
-2°	-1°	0	1°	2°	000	180
		020			010	190
		040			020	200
		060			030	210
		080			040	220
		100			050	230
		120			060	240
		140			070	250
		160			080	260
		180			090	270
		200			100	280
		220			110	290
		240			120	300
		260			130	310
		280			140	320
		300			150	330
		320			160	340
		340			170	350
		360				
-4°	-2°	0	2°	4°		

# CASSENS & PLATH

AM LUNDEICH · 2850 BREMERHAVEN · TEL. (0471) 71011 · WEST GERMANY

Copying of this document, and giving it to others and the use or communication of the contents thereof, are forbidden without express authority. Offenders are liable to the payment of damages.

Weitergabe sowie Vervielfältigung dieser Unterlage, Verwertung und Mitteilung ihres Inhalts nicht gestattet, soweit nicht ausdrücklich zugestanden. Zuwiderhandlungen verpflichten zu Schadensersatz.