Installation & Operation Manual

NETcourse

Magnetic Compass Converter

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Content

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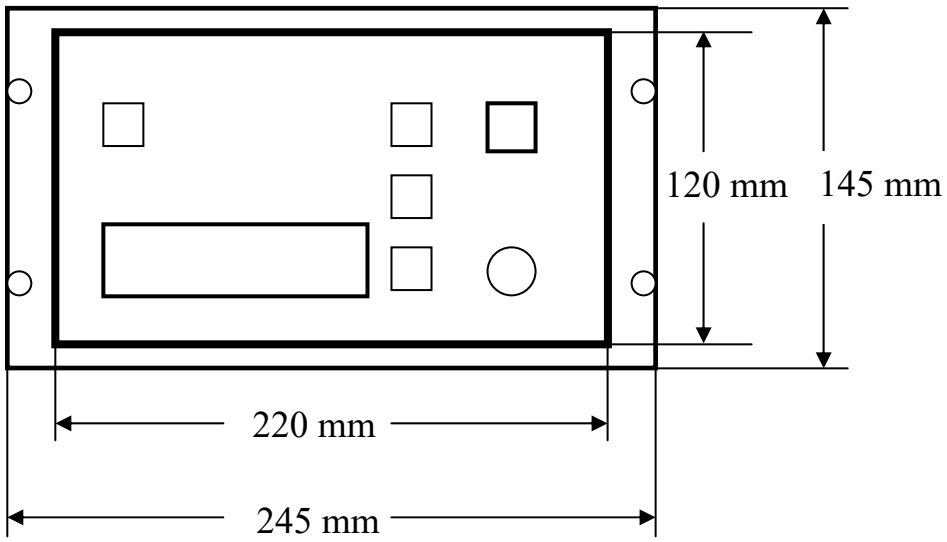
1) Drawings

1.1) Dimensions

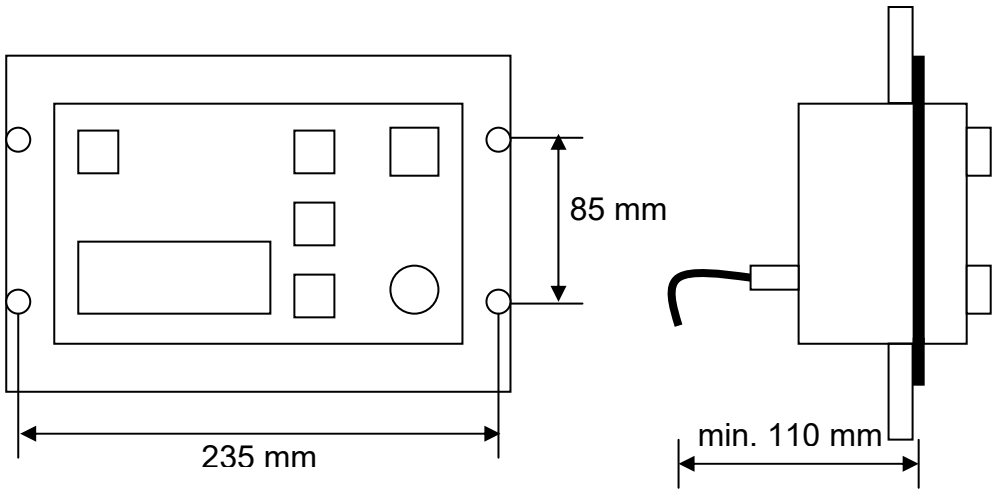
Flush mounting:



Weight: 2,1 KG

1.2) Mounting of Control Unit

Flush mounting (cut-out: 225 mm x 125 mm):



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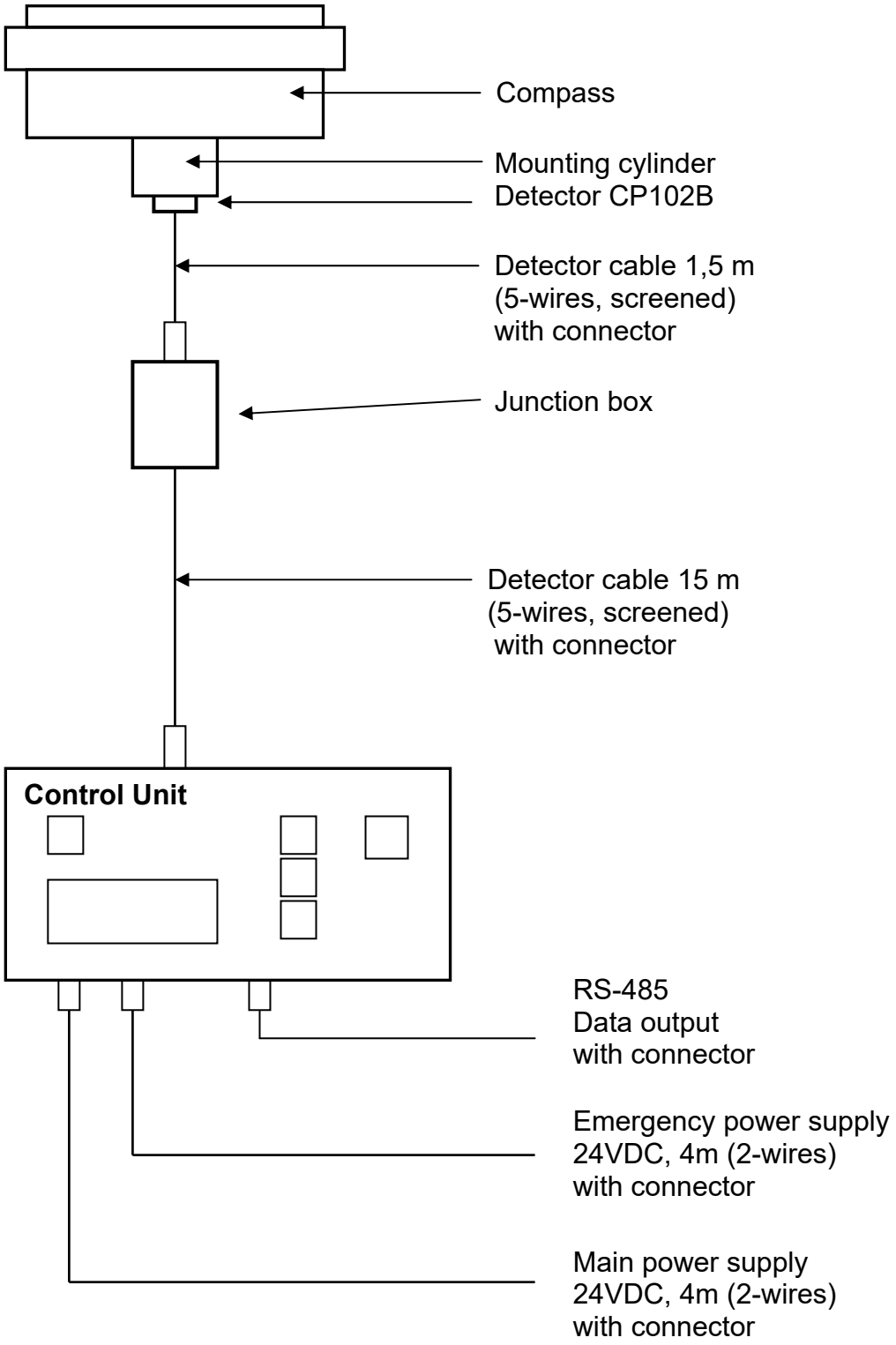
1.3) System Overview



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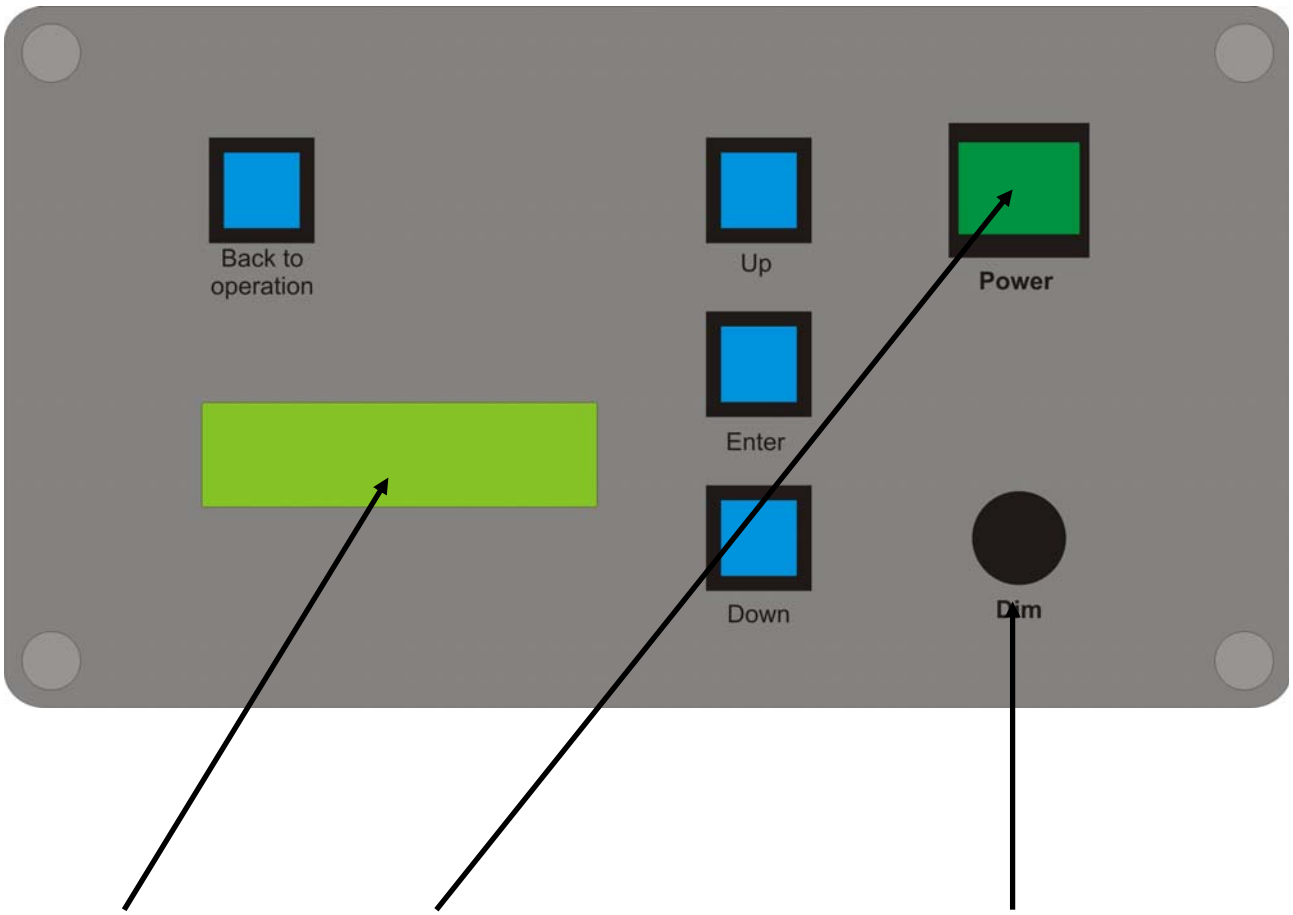
1.4) Control Unit, Front Controls:



1) LC-Display 2) On/Off switch 3) Dimmer

1) LC-Display shows actual functions, Menus or error messages

2) On/Off switch

3) Backlight dimmer of LC display

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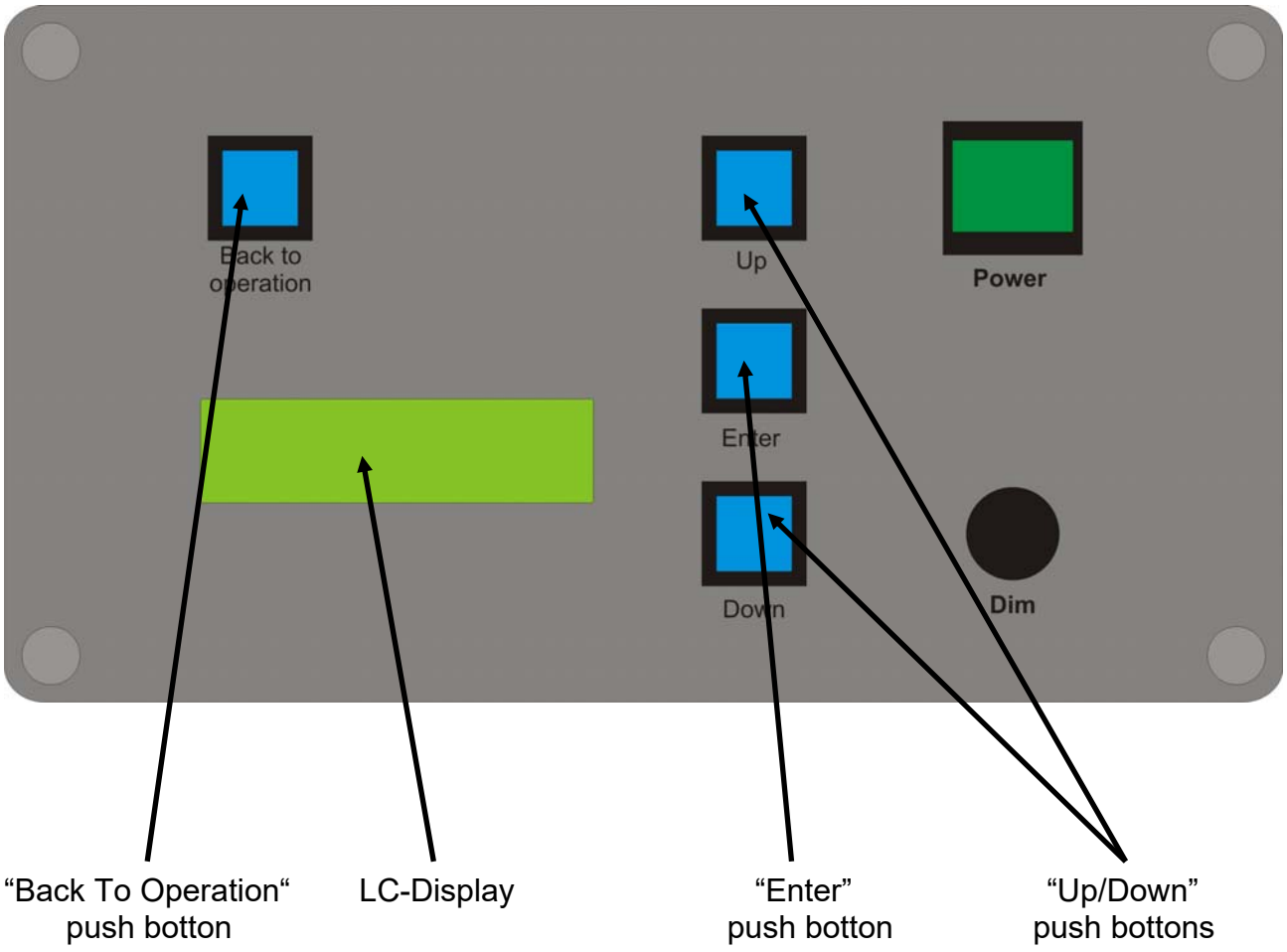
1.5) Control Unit, Front Push Buttons:



“Back To Operation“ push botton	Return to operation mode
“Up/Down” push botton	Moves Menu one step up or down
“Enter“ push button	Activates Menu mode, Selects Menu
LC-Display	Shows operation dialog and error messages

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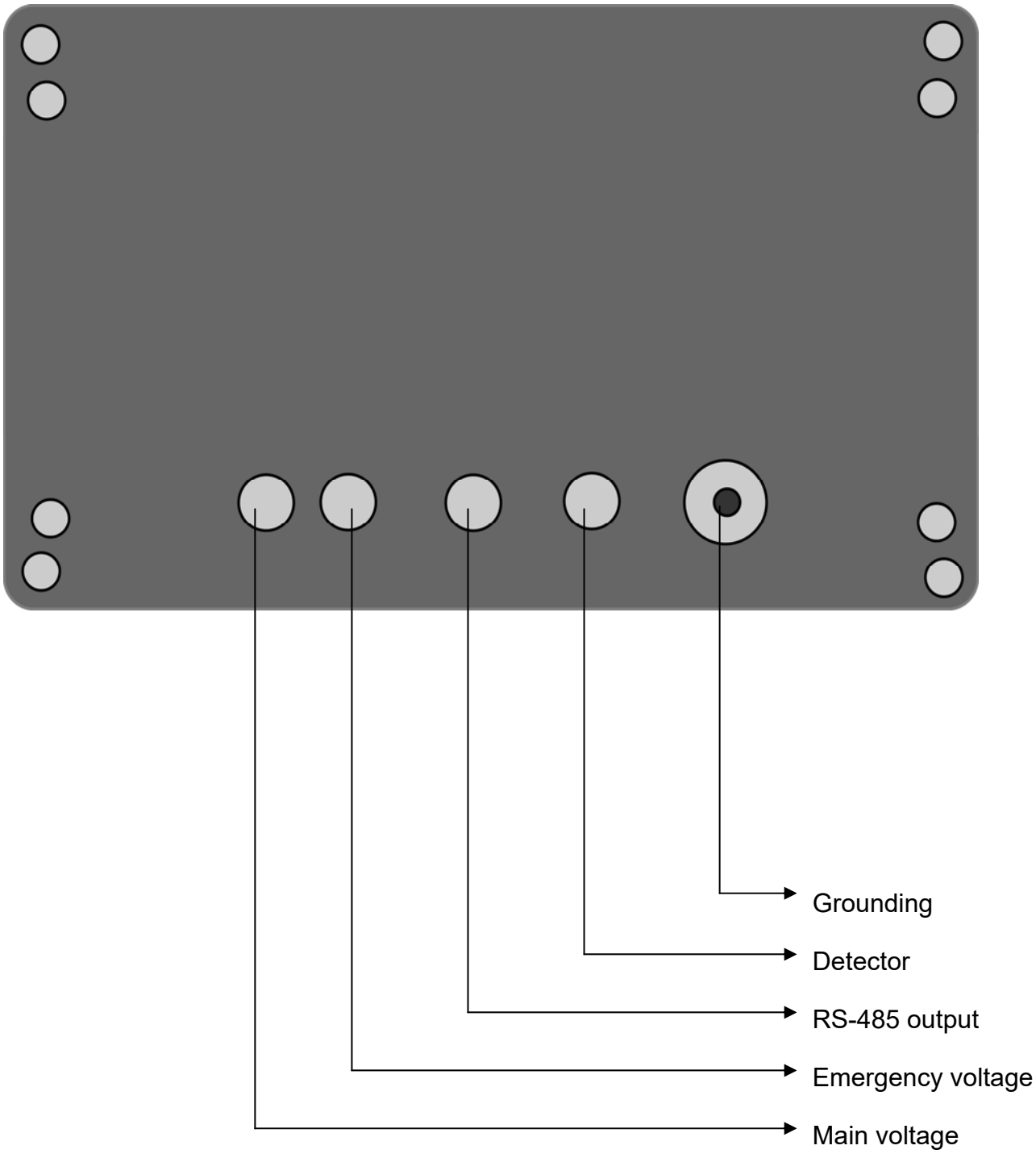
1.6) Control Unit, Rear



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2) Menu Mode

Press „Activate Menu/Enter“ to select.

Four Menus can be selected:
- “Load Default Error list“
- “Set Up Error list”
- “Transmission Protocol”
- “Detector Alignment”

Select required Menu by pushing “Up/Down“ push botton.
Press “Activate Menu/Enter“ to activate.
Press „Back To Operation“ to return to operation mode.

For safetey reasons NETcourse will return automatically to operation mode within two minutes if no push botton was pressed, except Menu “Transmission Error“ was activated before.

2.1) Menu Item “Load Default Error list“

By pressing “Load Default Error list“ the neutral or factoryside error table will be activated and stored. The actual error table will be deleted!

Accept safety warning by striking “Menu/Enter“ button. Cancel by “Back To Operation“.
During restorage do not strike any further key!

2.2) Menu Item “Set Up Error list“

Adjust the traditional magnetic compass before correction of transmission error!
Transmission error is the difference of the direct reading of the magnetic compass and the heading as displayed by NETcourse. This Menu item enables you to establish a errorlist. This is only necessary in case too large transmission errors are recognized. These transmission errors are caused by the direct interference of the corrector magnets to the detector, so these errors are not a malfunction of the instrument but they result from the ship´s magnetic iron resp. their correction! After activating this Menu item the display shows 0°, the first reference heading to establish errorlist. Steer the ship into magnetic heading 0° (it is wrong to take out only the compass itself from its suspension and rotate it into direction 0°). Accept this setting by “Menu/Enter“ push button. The NETcourse display now proceeds to 15°. Steer the ship into magnetic heading 15° and accept the setting same as above by actuating “Menu/Enter“ button. This way complete a total swing of 360° for each reference heading of 15°. It is not necessary to follow each point of the sequence of reference points. This Menu item also allows to select one of the reference headings (0°, 15°, 30°, 45° ....) individually. To choose the required reference heading use the “Up/Down“ push button and activate setting by pushing „Menu/Enter“ button. It is not necessary to pass all reference headings, each heading can be changed individually.

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2.3) Menu Item “Transmission Protocol“

With this menu item the data output protocol can be selected.

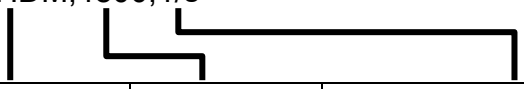
Two different sentence formats can be selected:

- $HCHDM,xxx.x,M*CS <CR> <LF>
- $HCHDG,xxx.x,,,,*CS <CR> <LF>

“xxx.x“ is the transmitted magnetic heading and “CS“ for the check sum.

Select the required sentence and data transmission parameters with “Up/Down“ and activate with “Menu/Enter“.

“HCHDM,4800,1/s”



Sentence:	Baud rate:	Transmissions per second:
HCHDM	4800	1 transmission per second
HCHDG	38400	10 transmissions per second
		30 transmissions per second

All transmissions are of 8 data bits, 1 stop bit and no parity.

2.4) Menu Item “Detector Alignment”

With this menu item the alignment of detector can be executed.
For installation of NETcourse it is necessary to align the detector to the magnetic compass. For alignment loosen screws of detector a little bit, so that detector can be turned slightly. Turn detector until displayed heading matches magnetic compass heading. Fix the screws of detector.

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3) Error Messages/ Removing Errors

If from time to time error message “No Detector Input Data” appears, this can be caused by an uncorrected heeling magnet of the compass.
So please check if at all corrections (deviation adjustment) were done. If not remove or position heeling magnet as far as possible to the compass with detector. To find out how to do this please refer to the relevant operations manual of the compass or compass binnacle.

Attention: The display shows existing operational errors and gives further information. Please follow this information and refer to the error shooting chapter of this operations manual. If the error cannot be removed in this way switch off the instrument and call the manufacturer.
Please pay attention to each error message carefully, else proper operation cannot be guaranteed and safety of the vessel may be endangered.

Error	*Reason*	*Remedy*
”Power Failure“,	Main- /Emergency voltage below 18 VDC.	Make sure power supply : 24 VDC.
”Transmission Error“,	Transmission error table not valid	Switch off and on instrument. Carry out transmission error correction procedure (ref. “Compass Reset“).
”No Detector Input Data“,	Detector data not valid	Make sure correct mounting of detector and right distance to compass. Make sure correct wiring of detector. Make sure that there are no magnetic interferences at detector location. Check correct function of detector by use of a multimeter *).
No function		Switch on instrument. Adjust dimmer to max. brightness to verify that power is connected. Make sure wiring and right voltage supply.
No data transmission. NETcourse shows no error message.		Make sure that data cables and connectors are in order. Interchange data cable A and B. Make sure that correct output data specification was selected.

*) Ref. to chapter „Pin Connection of Plugs/Connectors“
Measure resistance between:
Cosine und Reference: 60 Ohm, Sine und Reference: 60 Ohm, Sine und Cosine: 120 Ohm
Exitation 1 und Exitation 2: 50 Ohm, Exitation 1 or Exitation 2 and Reference: not connected
The values should be found within a tolerance of +/- 20%, else the detector might be defective.

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4) Installation

4.1) Installation of Detector

This chapter may be passed in case the detector is already installed to the compass when delivered.

As heading source a conventional compass has to be used. Installation of detector is usually done by glueing it from below centric to the lower cover glass. Between detector and lower cover glass of the compass a certain distance has to be kept. This will be guaranteed by a special mounting cylinder which may be ordered from Cassens & Plath as an extra. The height of the cylinder to keep the right distance between detector and compass is calculated so that on the one hand any influence from the detector to the compass indication can be excluded and on the other hand the magnetic field of the compass card assembly is strong enough to drive the detector.

Attention:
If the detector is too close to the compass the directional system will be deflected!
If the detector is too far away from the compass the magnetic field strength will be too low to drive the detector!
Keep the correct distance otherwise safe navigation will be not possible!

If the correct distance is unknown there are two different ways do determine it:

1. The magnetic moment (the strength of the magnets) of the compass is known. This value will often be found in the compass certificate. If, for example, the value is between 2.0 .... 4.5 Am^2, the correct distance between detector and magnet of card assembly is 110 mm. If the exact location of the magnets inside the float of the directional system below the card level is unknown take 15 mm for this.
2. Mounting will be done by a qualified compass workshop owning a regular compass test bench. The procedure to find the correct distance is the same as finding weak iron interference by swirl error examinations. The compass is turned in a 4 min 360° turn with and without detector. If there is any quadrantal weak iron influence visible with the detector fitted the distance has to be increased. The best distance is the one where just no longer any influence is visible; add 5 mm to this.

Detector mounted from above
This may be necessary in case the compass is an overhead compass, for example, or there is already another detector from below. To find the correct distance between detector and top cover glass, proceed same as above. It is necessary to interchange the green and grey wire in the junction box.

Adjustment of Detector Alignment
Turn the detector so that the arrow shows in ahead direction of the compass. Now continue with chapter 2.2) Menu Item “Transmission Error“ and follow the mentioned procedure.

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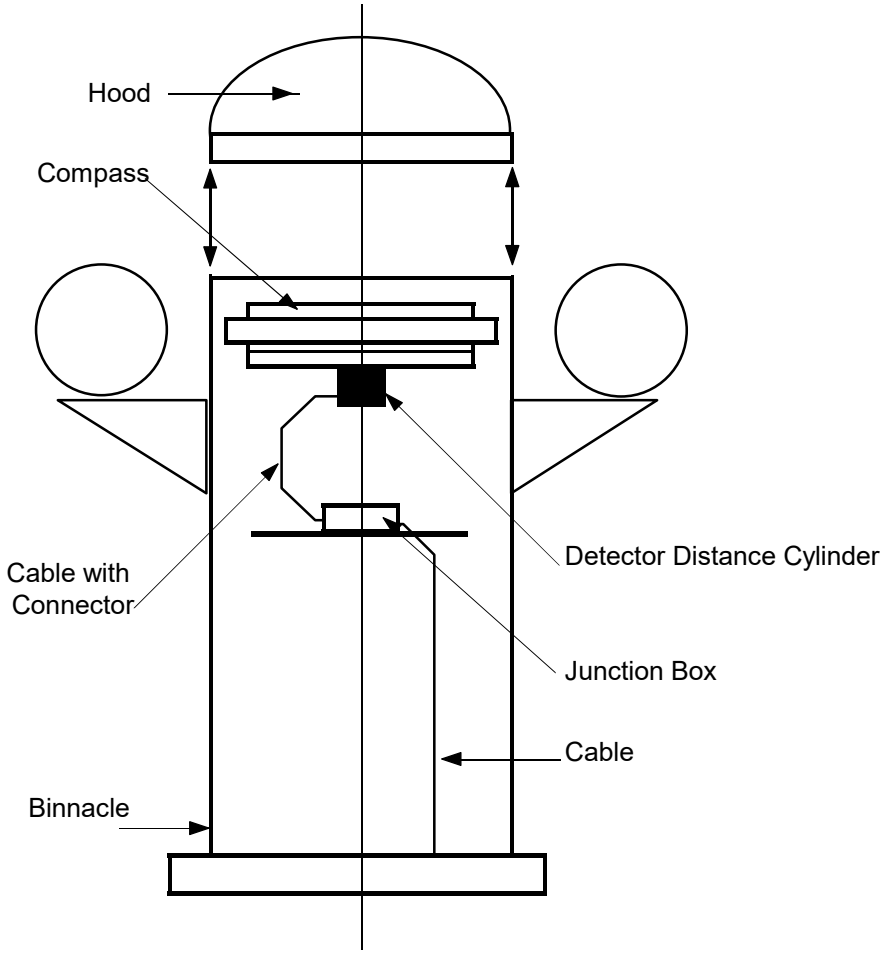
4.2) Installation of Junction Box

The junction box allows easy removal of the compass from the binnacle and easy separation of detector cable.

4.3) Location of Detector and Junction Box within Compass Binnacle:



Attention: Make sure that detector cable does not impair free movement of compass gimbal and that cables do not obstruct visibility of reflection reading!

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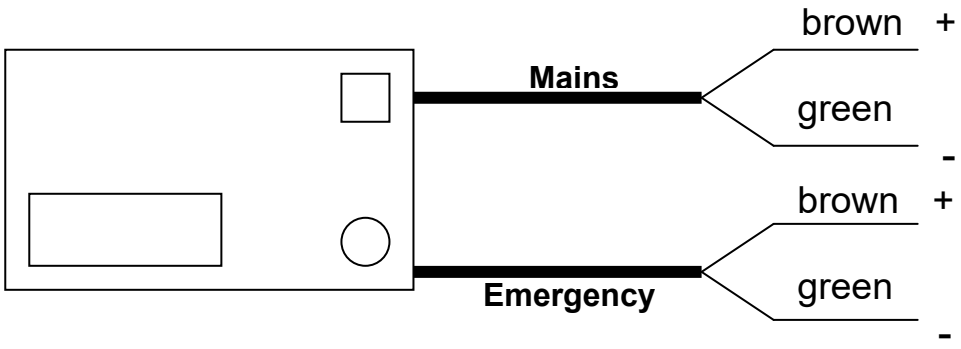
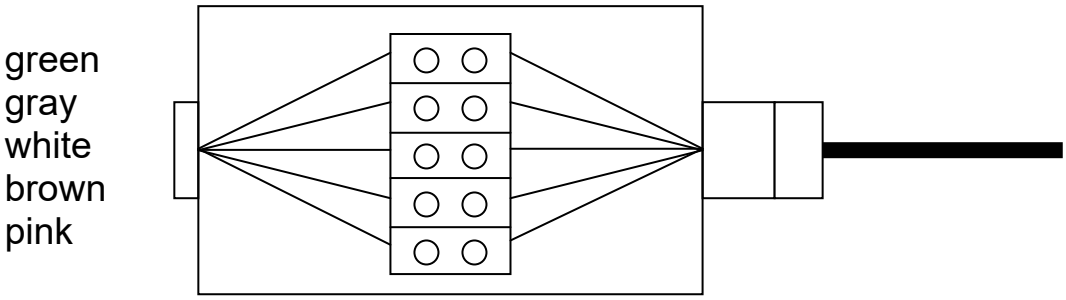
5) Wiring:

5.1) Power Supply

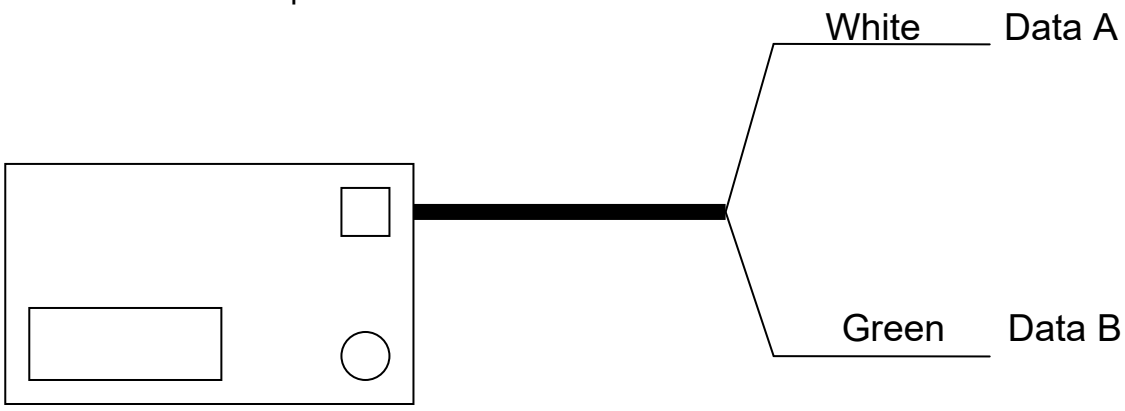


5.2) Connection of Junction Box

Connect color to color



5.3) Connection of Data Output



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5.4) Extending / Shortening of Detector Cable

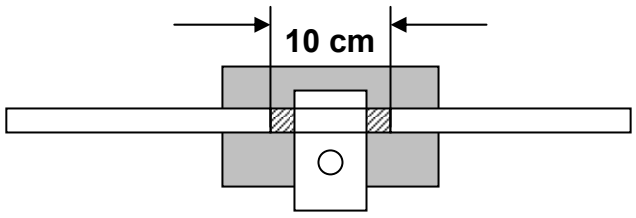
Alteration of detector cable length is possible if the total length does not exceed 35 m.
It is not recommended to disassemble the connectors because often problems are caused by the small dimensions of the pins. The better way is to cut the cables themselves at a suitable spot and to use a junction box.

6) Grounding

Although NETcourse has passed EMC qualification tests according to EN 60945, an accurate grounding is necessary to avoid interferences caused by electromagnetic radiation like UHF or VHF and electromagnetic pulses (EMP). For example radio telefones are known to disturb the function of the electronics.

1. For this, fix the casing to the wall steel wall of the superstructure after removing insulating paint at the rear of the casing and the adjacent wall.
2. If this is not possible use a massive copper wire and fix it on one side at the grounding screw of the casing and on the other side at the ship´s steel hull. Take the shortest way.
3. If such a grounding is not possible or not successful proceed as follows: Remove the plastic insulation of the cables. Do not destroy the screening network below. Skin the cable abt. 10 mm of length. Bring the skinned part in direct contact to the ship's steel. Before, remove insulating paint from the wall. Use a metallic clamp to fix the cable. One of the grounding points should be as close as possible to where the cable leads into the superstructure. Choose the second point (if any) as close as possible to the control unit.

Grounding according to 3.:



Skin cable about 10 cm. Remove insulating paint from the surface below. Use clamp to press grounding network of cable to metallic steel of the superstructure.

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7) Start-up Procedure

7.1) Check the Power Supply

Check power supply voltage 24 VDC (main- & emergency) with multimeter (ref. to page: “Pin Connection of Plugs/Connectors”)

7.2) Start Instrument and Check Operation

Switch on the instrument after having completed installation works.
In the display you will see “transmitting”. Now change to menu mode (ref. to chapter “Menu Mode”) and choose the required data sentence format (ref. to Menu item “Transmission Protocol”).

7.4) Check of Transmission Accuracy

Check by comparing the heading of the connected unit with the indication of the magnetic compass. If the difference is too great create a new error table (ref. to Menu item “Transmission Error“).

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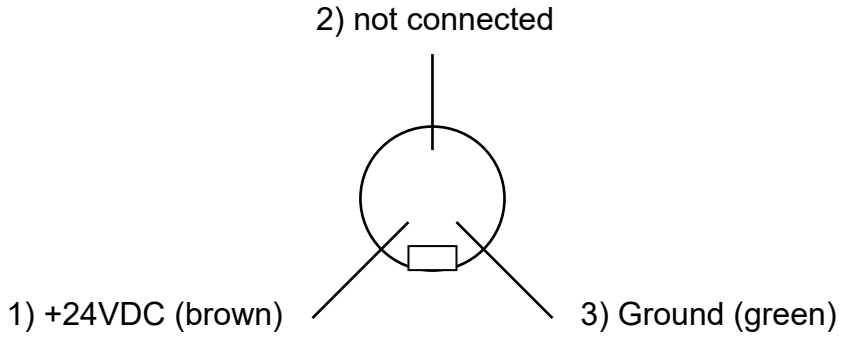
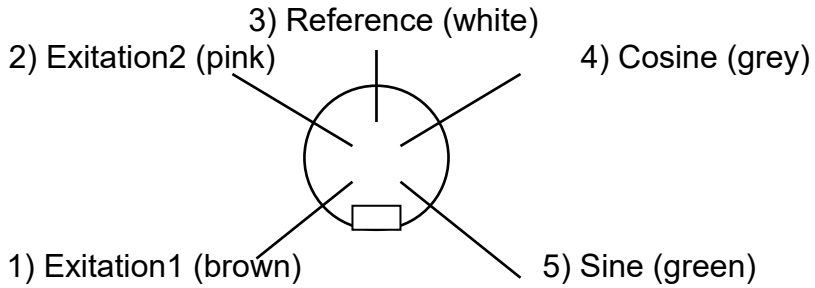
8) Pin Connection of Plugs/Connectors

(As to be seen from rear of casing)

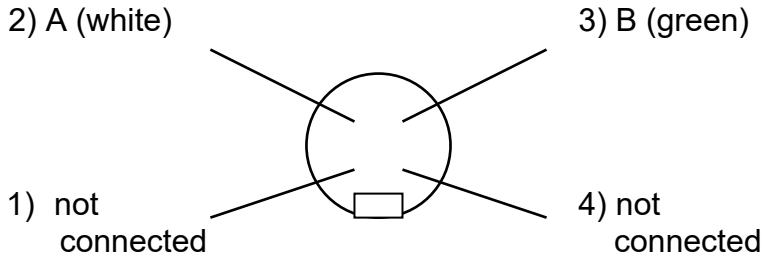
Power Supply (3-pin):
(24VDC, identical for mains & emergency supply)



Detector (5-pin):



RS-485/ RS-422 Data Output (4-pin):



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