



KONGSBERG

Installation Manual

MGC[®] COMPASS

MGC Sensor Unit & Interface Cabinet





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MGC Sensor Unit & Interface Cabinet

Installation Manual

This manual provides you with the basic information required to install the MGC Sensor Unit with the Interface Cabinet MGC-IFC-55-JB7. This cabinet contains the JB7 Junction Box. For more detailed information on the installation of a complete MGC system, refer to the manuals provided for system installation.

MGC-D-115/472872/5/D

March 2025 © Kongsberg Discovery AS

Document history

Document number: MGC-D-115/472872 / Revision 5/D		
Rev. 1	December 2020	First issue.
Rev. 2	April 2021	The text for pin 10 and pin 20 on J6 terminal on MGC JB7 has been changed.
Rev. 3	September 2021	Changed table for power: "power output" for F3, F4.
Rev. 4	June 2024	Updated with new dampening adapter plate.
Rev. 5	March 2025	Updated cabinet connections.

Document information

- Product: MGC® COMPASS
- Document: Installation Manual
- Document part number: MGC-D-115/472872
- Revision: 5/D

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Warning

The equipment to which this manual applies must only be used for the purpose for which it was designed. Improper use or maintenance may cause damage to the equipment and/or injury to personnel. You must be familiar with the contents of the appropriate manuals before attempting to operate or work on the equipment.

Kongsberg Discovery disclaims any responsibility for damage or injury caused by improper installation, use or maintenance of the equipment.

Disclaimer

Kongsberg Discovery AS endeavours to ensure that all information in this document is correct and fairly stated, but does not accept liability for any errors or omissions.

Support information

If you require maintenance or repair, contact Kongsberg Discovery's support organisation. You can contact us using the following address:

support.seatex@kd.kongsberg.com. If you need information about our other products, visit <http://www.kongsberg.com/discovery>.

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About this manual

Purpose of manual

The purpose of this manual is to provide the information, procedures and basic drawings required for the physical installation of the R-series MGC Sensor Unit and the Interface Cabinet with the JB7 Junction Box.

Target audience

The publication is intended for technical personnel such as skilled shipyard and factory workers, electricians, qualified engineers, and naval architects.

License information

The MGC product requires an export license.

Registered trademarks

MGC® is a registered trademark in Norway and Europe.

MGC® COMPASS

Topics

[System description, page 8](#)

[System diagram, page 9](#)

[System units, page 9](#)

[Scope of supply, page 10](#)

[Product restrictions, page 10](#)

[Network security, page 11](#)

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System description

The MGC® COMPASS consists of the MGC Sensor Unit and the MGC JB7 Junction Box.

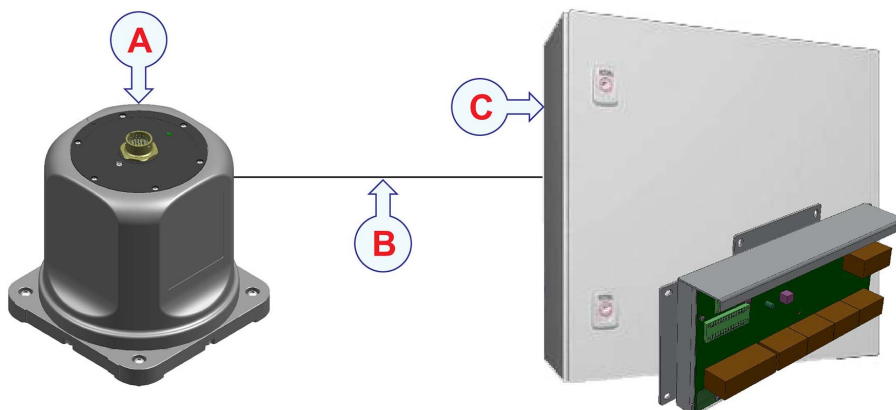
The MGC® COMPASS is type approved by IMO (International Maritime Organisation) as a gyro compass for navigation purposes. It can be used together with a heading and bearing repeater.

The MGC® COMPASS can also be operated as an inertial navigation system. Then it will output position and heading. Linear position and velocity measurements can be output in up to four different points on the vessel.

Special arrangements have been made with regard to mounting of the unit. This makes it easy to align the unit with the vessel axis.

System diagram

The MGC Sensor Unit is delivered with the MGC JB7 Junction Box which is mounted in the MGC Interface Cabinet.



- A. MGC Sensor Unit
- B. Sensor Unit cable (MGC-E-CJB7)
- C. MGC Interface Cabinet with MGC JB7 Junction Box

System units

Topics

[Sensor Unit description, page 9](#)

[MGC Interface Cabinet description, page 10](#)

Sensor Unit description

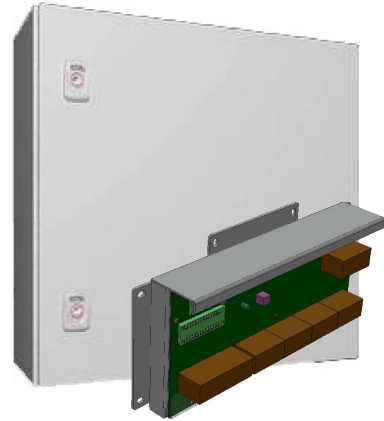
The Sensor Unit is a north-seeking gyro compass. It is based on three Ring Laser Gyros (RLG) and three linear accelerometers. The unit can also be operated as an inertial navigation system. Then it will output position and heading.



MGC Interface Cabinet description

The MGC Interface Cabinet provides extended interfaces between the Sensor Unit and external equipment.

The cabinet contains the MGC-E-JB7 Junction Box with signal connections. It also contains power supply connections and network patch connections.



Scope of supply

Basic items

Observe the basic items provided with a standard MGC® COMPASS delivery.

- MGC Sensor Unit
- MGC Sensor Unit cable
- MGC Interface Cabinet with JB7 Junction Box
- End-user documentation

Additional optional items

The following additional optional items can be used together with the MGC® COMPASS. Additional optional items can be purchased from Kongsberg Discovery AS.

- Sensor Unit adapter dampening plate

Product restrictions

Topics

[Restrictions in export, page 10](#)

[Limited warranty, page 11](#)

Restrictions in export

Export of the MGC component requires an export license.

Important:

Notice to customer/importer/end user.

The MGC specified here is shipped from Norway in accordance with the Ministry of Foreign Affairs' Official Notification on Export Control and U.S. Export Administration Regulations (EAR).

The MGC will be subject to restrictions if re-exported from your country, including but not limited to a re-export license from the US Government.

Limited warranty

Changes or modifications to the product not explicitly approved by Kongsberg Discovery AS will void the warranty.

The liability of Kongsberg Discovery AS is limited to repair of this product only under the given terms and conditions stated in the sales documents. Consequential damages such as customer's loss of profit or damage to other systems traceable back to this product's malfunctions, are excluded.

The warranty does not cover malfunctions of the product resulting from the following conditions.

- The Sensor Unit is not shipped in the original transportation box.
- The Sensor Unit has been exposed to extreme shock and vibrations.
- The Sensor Unit housing has been opened by the customer.
- Incorrect power connection.

Network security

If the MGC® COMPASS product is connected to a local area network, data security is important.

Equipment manufactured by Kongsberg Discovery is often connected to a local area network (LAN). When you connect a computer to a local area network you will always expose the data on that computer. All the other computers connected to the same network may be able to access your data. Several threats are imminent:

- Remote computers can read your data.
- Remote computers can change your data.

- Remote computers can change the behavior of your computer, for example by installing unwanted software.

Usually, two parameters are used to define the threat level:

1. The likelihood that any remote computer will do any of the above.
2. The damage inflicted if a remote computer succeeds doing any of the above.

Kongsberg Discovery has no information about your complete system installation. Products provided by Kongsberg Discovery are always regarded as stand-alone offline systems. They are regarded as stand-alone even though they may be connected to a local area network for sensor interfaces or data distribution.

Note:



No network safety applications are installed on Kongsberg Discovery computers. The computer is not protected against viruses, malware or unauthorized access by external users.

Securing the MGC® COMPASS system has no meaning unless you have established a policy that secures all the computers on the network. This policy must include physical access by trained and trusted users. The customer or end user of the MGC® COMPASS system is responsible for defining and implementing a security policy and providing the relevant network security applications.

Note:



Kongsberg Discovery will not accept any responsibility for errors or damages caused by unauthorized use of or access to the MGC® COMPASS system.

Support information

If you need technical support for your product you must contact a Kongsberg Discovery office. A list of all our offices is available on our website.

- **Company name:** Kongsberg Discovery AS
- **Address:** Havnegata 9, N-7010 Trondheim, Norway
- **Telephone:** +47 33 03 41 00
- **Telephone, global 24h support:**
Europe, the Middle East and Africa: +47 33 03 24 07

Asia Pacific: +65 97 11 24 07

Americas: +15 04 303 5244

- **E-mail address:** support.seatex@kd.kongsberg.com
- **Website:** <http://www.kongsberg.com/discovery>

KM-Support App

Kongsberg Discovery support is also available in the KM-Support App. Our support application is available for free in the App Store and Google Play.

Preparing the installation

Topics

[Mechanical drawings, page 14](#)

[Necessary tools and equipment, page 14](#)

[Sensor Unit transportation box, page 15](#)

[Location of hardware units, page 15](#)

[MGC® COMPASS power requirements, page 17](#)

Mechanical drawings

Outline dimension drawings are included in this manual.

Unless otherwise specified, all measurements are in millimetres. The drawings are not to scale.

Related topics

[Drawings, page 35](#)

Necessary tools and equipment

We assume that you are equipped with a standard set of tools. This tool set must comprise the normal tools for electronic and electromechanical tasks. This includes different screwdriver types, pliers, spanners, a cable stripper, a soldering iron, etc. Each tool must be provided in various sizes. We recommend that all tools are demagnetized to protect your equipment.

Unless otherwise stated, all mounting hardware (such as bolts, nuts, washers, screws etc.) referred to in this document is to be supplied by the customer or the shipyard.

Special equipment:

- Torque screwdriver, less than 10 Nm

Sensor Unit transportation box

The unit is shipped in a specially designed transportation box. Keep the unit stored within the box until everything is ready for installation of the unit.

Note: _____



After the unit has been installed, please keep the transportation box. The unit must be shipped in this box for maintenance or repair in order to maintain the warranty.

Location of hardware units

Topics

[Sensor Unit location, page 15](#)

[Selecting the best location for the Interface Cabinet, page 16](#)

Sensor Unit location

Correct location of the unit is important for the system performance. Consider these factors when installing the unit.

- The unit is designed for installation in an indoor environment and for operation within the temperature range.
- Mount the unit with the Forward arrow on the Sensor Unit top pointing in the bow direction and parallel to the centre line of the vessel.
- Mount the unit onto a rigid and stable structure. Mount the unit directly onto the hull structure, if possible.
- Mount the unit away from areas with high frequency vibrations. Such as hydraulic pumps and valves.

- Mount the unit away from the heat of machinery, heaters and air conditioning systems.
- Mount the unit in a location where it is not subject to sea water.

Be aware of vibrations

The unit has some sensitivity to vibrations around sequences of 100 Hz (100, 200, 300 Hz and so on). Such vibrations should not exceed 0.5 m/s^2 in any direction.

Be aware of resonance

Take care when mounting the Sensor Unit to the vessel's hull. This to avoid self-resonance, which in turn can amplify the dithering frequencies of the gyroscopes. Around 600 Hz. A correctly mounted Sensor Unit will typically emit 58 - 64 dBA (1 metre). If not mounted correctly, the sound pressure level may increase to 85 dBA.

Be aware of temperature changes

The unit is sensitive to frequent temperature changes. The safest location for the unit is where the temperature is low and the changes in temperature are slow.

Be aware of corrosion

The unit must not be subject to an environment which can cause corrosion. For example exposure to sea water.

Related topics

[Sensor Unit dimensions](#), page 36

[Adapter dampening plate dimensions](#), page 37

[Mounting the Sensor Unit](#), page 18

[Mounting the adapter dampening plate and Sensor Unit](#), page 21

Selecting the best location for the Interface Cabinet

Consider these factors when installing the cabinet. The cabinet contains the MGC JB7 Junction Box.

- Place the cabinet within two meters of the Sensor Unit. The Sensor Unit cable is three meters long.
- Make sure that the cabinet door can be fully opened for unrestricted access.

Related topics

[Cabinet dimensions](#), page 38

[Mounting the Interface Cabinet with MGC JB7 Junction Box](#), page 25

MGC® COMPASS power requirements

The MGC® COMPASS must be powered by a clean 24 V DC source. The MGC® COMPASS power lines are galvanically isolated from the signal circuits inside the unit. The maximum isolation voltage inside the MGC® COMPASS is 200 V DC.

CAUTION:



Permanent damage to the MGC® COMPASS may occur if power is applied to the Ethernet or digital conductors. Therefore, it is very important to measure the power voltage at the connector before the MGC® COMPASS is connected. Any damage resulting from incorrect connection or power, is not covered by the Kongsberg Discovery AS warranty.

Installation

Topics

[Mounting the Sensor Unit, page 18](#)

[Mounting the adapter dampening plate and Sensor Unit, page 21](#)

[Mounting the Interface Cabinet with MGC JB7 Junction Box, page 25](#)

Mounting the Sensor Unit

A correct installation of the Sensor Unit is important in order to ensure high quality and accurate measurements.

Before you begin

Note: _____



This procedure applies to the MGC R4 and R5 COMPASS models.

You have found a rigid and stable mounting surface for the unit. This is important in order to avoid vibration and resonance.

About this task

Sensor Unit base plate

If you make your own base plate, you can use the provided bolt pattern to mark the holes.

- Place the Sensor Unit and the angle bracket in an orientation where the **Forward** arrow at the top of the unit is pointing in the bow direction.

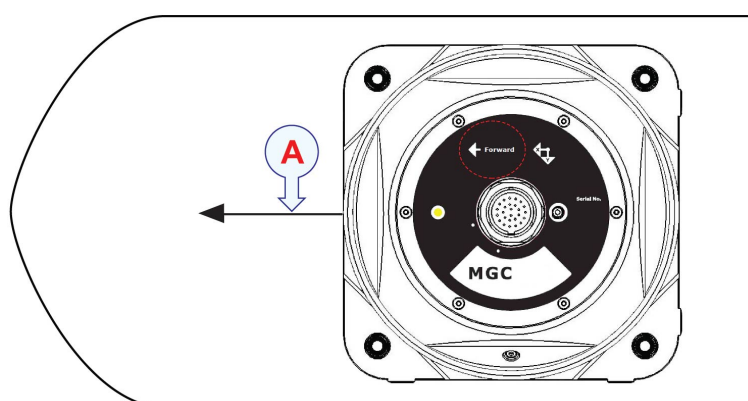
- Mark seven holes in the mounting surface for the Sensor Unit and the angle bracket screws.
- Remove the Sensor Unit and the angle bracket.
- Drill seven M6 holes in the mounting surface for the Sensor Unit and the angle bracket screws.
- Thread seven M6 screw holes with threaded depth minimum 11 mm.

Sensor Unit angle bracket

It is optional to use the angle bracket. However, it is very useful if you for some reason have to move the Sensor Unit. Then the angle bracket will remain in place and it will be easy to reinstall the Sensor Unit.

Sensor Unit mounting orientation

The default mounting orientation for the unit is with the **Forward** arrow at the top of the unit pointing in the bow direction of the vessel.



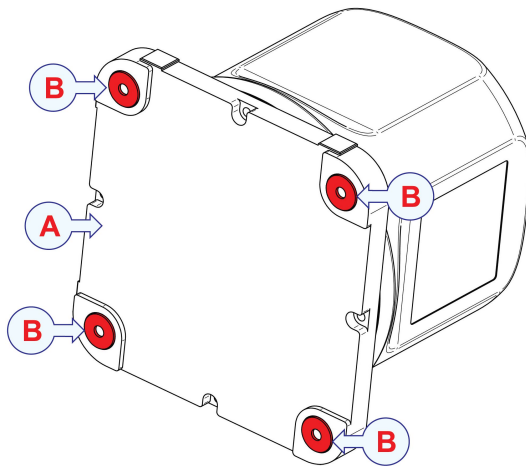
A. Bow direction of vessel

Procedure

1. Identify the best mounting location for the unit.
2. Make sure that the insulation disks surrounding the four screw holes on the Sensor Unit base plate are in place.

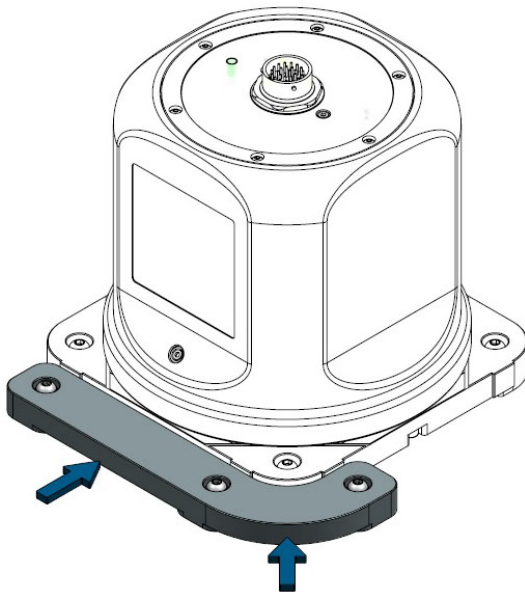
Important:

This is important for electrical and mechanical insulation of the unit from the mounting surface due to earthing. It is also important in order to prevent corrosion.



- A.** *Sensor Unit base plate*
- B.** *Insulation disks surrounding screw holes*

3. Place the base plate for the Sensor Unit on the mounting surface.
4. Place the Sensor Unit base plate in an orientation where the **Forward** arrow at the top of the unit is pointing in the bow direction.
5. Enter a plastic bushing, a washer and an M6 screw for each Sensor Unit screw hole.
6. Tighten the screws to fasten the Sensor Unit.
Tighten the four M6 screws for the Sensor Unit in steps in a diagonal pattern.
Recommended torque steps is 1.5 Nm, 3.5 Nm and 7.9 Nm.
7. Place the angle bracket next to the Sensor Unit.



8. Fasten the angle bracket.

Tighten the three M6 screws in steps while applying pressure to the angle bracket towards the Sensor Unit. Recommended torque steps is 1.5 Nm, 3.5 Nm and 7.9 Nm.

Related topics

[Sensor Unit location](#), page 15

[Sensor Unit dimensions](#), page 36

[Cabling between Sensor Unit and Interface Cabinet](#), page 26

Mounting the adapter dampening plate and Sensor Unit

A correct installation of the Sensor Unit is important in order to ensure high quality and accurate measurements.

Before you begin

Note: _____



This procedure applies to the MGC R1, R2 and R3 COMPASS models.

You have found a rigid and stable mounting surface for the unit. This is important in order to avoid vibration and resonance.

If your Sensor Unit is a replacement unit, use the adapter dampening plate to place the Sensor Unit on.

If your Sensor Unit is a new installation, you do not need to use the adapter dampening plate.

About this task

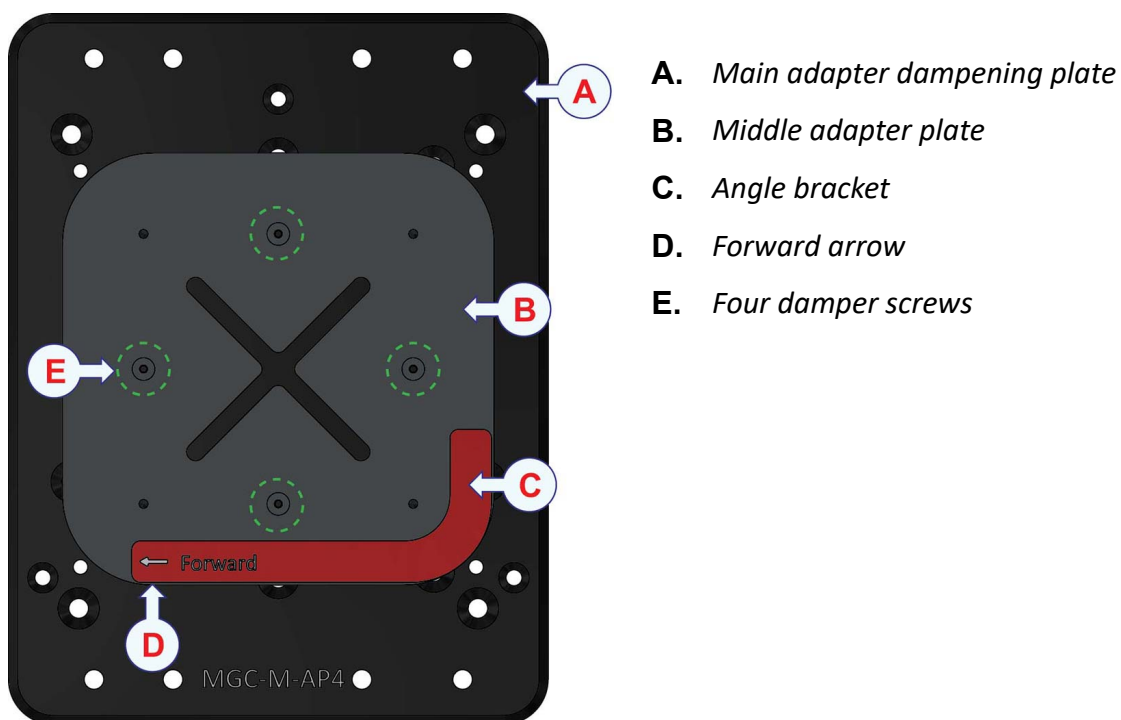
Sensor Unit adapter dampening plate

The ready made adapter dampening plate has holes which fit the Sensor Unit and the base plate for an easier installation. This adapter plate is also designed for replacement of the Sperry Navigat 2100, Navigat X mk1, Navigat 100, Navigat 200 and the Anshutz STD 22 gyro compasses. The mounting holes on the adapter dampening plate will fit the mounting holes on these gyro compasses.

The adapter dampening plate has dampening for noise reduction and can be used to reduce the noise from the Sensor Unit. The adapter plate can be used on the MGC R1 and MGC R2 models without any reduction in accuracy.

If the orientation of the adapter dampening plate can be freely selected, mount the adapter plate with the **Forward** arrow pointing in the bow direction of the vessel.

If you make your own adapter plate, you can use the provided bolt pattern to mark the holes.

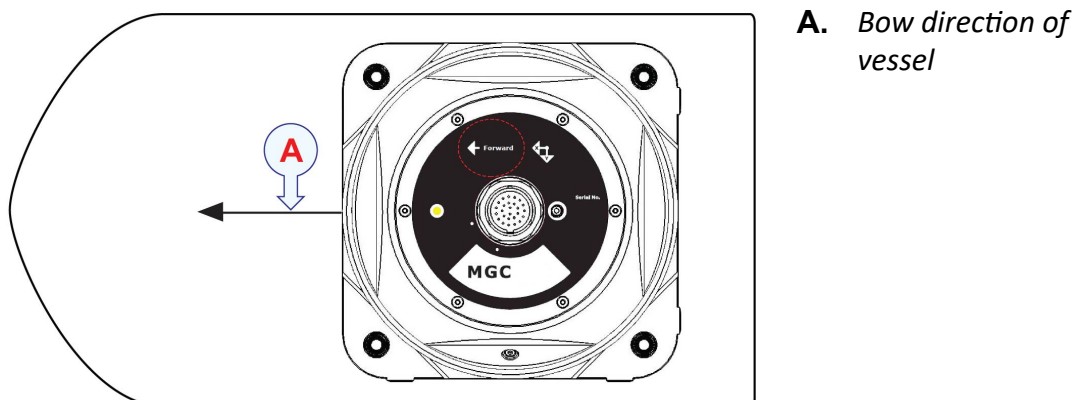


Sensor Unit angle bracket

The angle bracket is fixed on the middle adapter plate. The **Forward** arrow label is attached to the angle bracket.

Sensor Unit mounting orientation

The default mounting orientation for the unit is with the **Forward** arrow at the top of the unit pointing in the bow direction of the vessel.

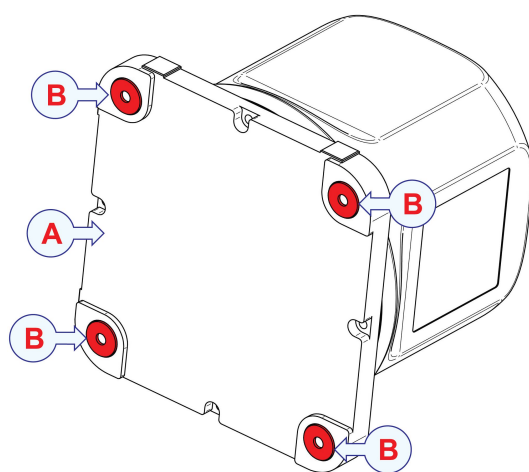


Procedure

1. Identify the best mounting location for the unit.
2. Make sure that the insulation disks surrounding the four screw holes on the Sensor Unit base plate are in place.

Important:

This is important for electrical and mechanical insulation of the unit from the mounting surface due to earthing. It is also important in order to prevent corrosion.



A. Sensor Unit base plate

B. Insulation disks surrounding screw holes

3. Place the dampening plate for the Sensor Unit on the mounting surface.
4. Identify the best mounting location for the replacement adapter plate either on existing gyro compass holes or by making new holes.
5. When the mounting location has been identified, place the adapter plate on the foundation in the preferred orientation.
6. **Forward arrow is pointing in bow direction of vessel:**
 - a. Fasten the adapter plate to existing holes in the foundation or mark and drill new holes in the foundation according to the adapter plate bolt pattern. Tighten the screws.
7. **Forward arrow is not pointing in bow direction of vessel:**
 - a. Fasten the adapter plate to existing holes in the foundation or mark and drill new holes in the foundation according to the adapter plate bolt pattern. Tighten the screws.
 - b. Disassemble the middle plate by unscrewing the four damper screws. Use the embrace tool delivered with the adapter plate to unscrew the damper screws.

- c. Remove the plate.
 - d. Rotate the middle plate so that the Forward arrow label on the angle bracket points in the bow direction of the vessel.
 - e. Place the middle plate on the adapter plate dampers in this orientation.
 - f. Use locking washers on the damper screws and fasten the middle plate to the adapter plate by tightening the screws.
8. Place the Sensor Unit on the adapter plate with the Forward arrow on top of the Sensor Unit pointing in the bow direction of the vessel.



9. Enter the four M6 screw in the Sensor Unit mounting holes and fasten the unit to the adapter plate.
10. Tighten the four M6 screws in steps in a diagonal pattern. Recommended torque steps: 1.5 Nm, 3.5 Nm and finally 7.9 Nm.

Related topics

[Sensor Unit location](#), page 15

[Sensor Unit dimensions](#), page 36

[Adapter dampening plate dimensions](#), page 37

[Cabling between Sensor Unit and Interface Cabinet](#), page 26

Mounting the Interface Cabinet with MGC JB7 Junction Box

The MGC Interface Cabinet provides interfaces between the Sensor Unit and external equipment.

Before you begin

The mounting surface must be sufficiently smooth. Make sure that there is adequate carrying capacity for wall mounting.

About this task

The MGC JB7 Junction Box is mounted inside the MGC Interface Cabinet when it is delivered from Kongsberg Discovery AS.

Although the Sensor Unit cable is 3 metres long, the cabinet must not be mounted more than 2 metres away from the Sensor Unit. Cable entry is found at the bottom of the cabinet. Make sure that the cabinet door can be fully opened for unrestricted access.

Procedure

1. Find a suitable location for the cabinet. Place it within the distance of the Sensor Unit cable.
2. Make holes for the screws with which the cabinet is fastened.
3. Open the cabinet door to gain access to the screw holes. Fasten the cabinet with four screws.
4. Close the cabinet door.

Related topics

[Selecting the best location for the Interface Cabinet](#), page 16

[Cabinet dimensions](#), page 38

[Cabling between Sensor Unit and Interface Cabinet](#), page 26

Cable layout and interconnections

Topics

[Cabling between Sensor Unit and Interface Cabinet, page 26](#)

[MGC Interface Cabinet connections, page 27](#)

Cabling between Sensor Unit and Interface Cabinet

The MGC Interface Cabinet provides extended interfaces between the Sensor Unit and external equipment.

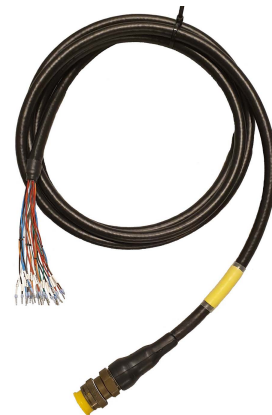
About this task

The MGC JB7 Junction Box is mounted inside the MGC Interface Cabinet when it is delivered from Kongsberg Discovery AS.

Wiring schematics for the interface cabinet is found inside the cabinet door.

Cables with shield has to be used in order to fulfil the MGC® COMPASS power and EMC requirements. The cable shield must be connected to ground in both ends.

The terminal blocks for the X1, X2 and J1 to J6 terminals can accommodate wires of until 2.5 mm²



Procedure

1. Insert the Sensor Unit cable into the cabinet through the cable gland plate.
2. Terminate the labelled wires to the J11 plugs on the Junction Box.

3. Connect the connector on the Sensor Unit cable into the connector at the top of the Sensor Unit.
4. Terminate the power wires into the X1 and X2 terminals.
5. Terminate the wires for RS-422 signal distribution to output on COM 1, 2, 3, 4 or 5 on the J1 terminal. Or to one of the replica ports. Terminals J2 to J5.
6. Terminate the wires for network connection, LAN 1, 2, 3, to the Patch Panel 1. Data 1, 2 or 3.
7. Terminate the wires for analog output signals and status signals from relays to the J6 terminal.
8. Terminate the wires for PPS input to the J1 terminal.
9. Terminate wires for any other RS-422 input to COM1, 2, 3, 4 or 5 on the J1 terminal.
10. Fasten the Sensor Unit cable to the wall, cable ladder or cable tray using cable strips or similar.
11. Apply power to the Interface Cabinet when all cable wires are connected.
12. Observe the status LED on the Junction Box inside the Interface Cabinet and on the MGC Sensor Unit.

Related topics

[Mounting the Sensor Unit](#), page 18

[Mounting the adapter dampening plate and Sensor Unit](#), page 21

[Mounting the Interface Cabinet with MGC JB7 Junction Box](#), page 25

[MGC Interface Cabinet connections](#), page 27

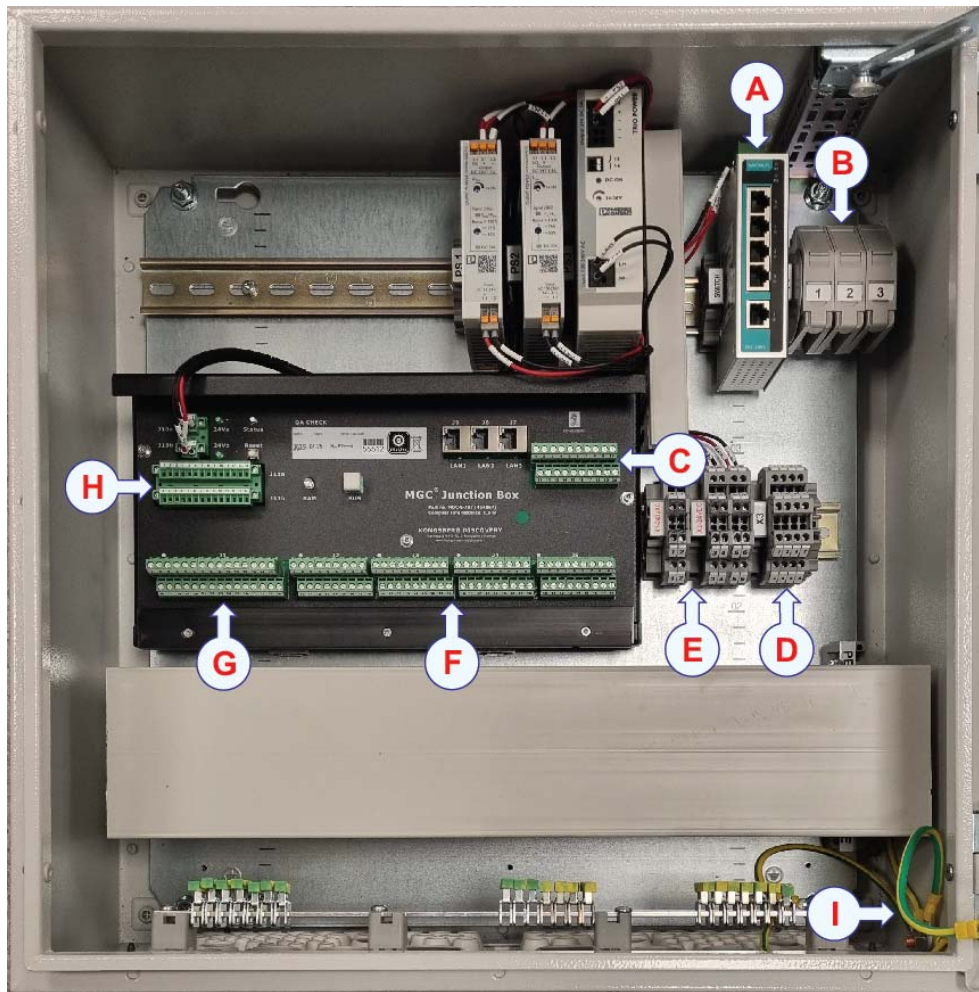
MGC Interface Cabinet connections

The MGC Interface Cabinet provides extended interfaces between the Sensor Unit and external equipment.

The cabinet contains the MGC-E-JB7 Junction Box with signal connections. It also contains power supply connections and network patch connections.

Wiring schematics for the Interface Cabinet is found inside the cabinet door.

The terminal blocks for the X1, X2 and J1 to J6 terminals can accommodate wires of until 2.5 mm².



- | | |
|----------------------------------|----------------------------------|
| A. Switch (optional) | F. Replica ports |
| B. Ethernet connections | G. COM ports |
| C. Relay and analog ports | H. Sensor Unit connection |
| D. Spare terminal blocks | I. Ground |
| E. Power connections | |

The system has eight output signals which are to be distributed on:

- 5 COM ports
- 8 replica ports with three outputs each
- 3 network ports
- 4 analog signals
- 3 relays

Interface Cabinet power connections

X1 terminal		X2 terminal	
Pin	Signal	Pin	Signal
1	100 - 240 VAC power input	3	+ 24 VDC power input
2	100 - 240 VAC power input	4	0 VDC power input
		5	+ 24 VDC power output
		6	0 VDC power output

Interface Cabinet Ethernet connections

Note: _____



The table gives the standard connections. If a switch is used, the connections may be different.

Ethernet connections	
Port	Connection
LAN 1	PP - 1
LAN 2	PP - 2
LAN 3	PP - 3

Interface Cabinet Sensor Unit cable connections

Table 1: Sensor Unit cable connections in the JB7 Junction Box - J11A terminal

J11A terminal				
Pin	Signal		Pair no.	Colour
1	MTX1_A-	RS-422A-, output data from MGC	2b	Orange
2	MTX1_B+	RS-422B+, output data from MGC	2a	White
3	MRX1_A-	RS-422A-, input data to MGC	3b	Green
4	MRX1_B+	RS-422B+, input data to MGC	3a	White
5	MRX2_A-	RS-232, data to MGC	7a	Red
6	MRX2_B+		14a	Black
7	MTX2_A-	RS-232, data from MGC	7b	Orange
8	MTX2_B+		14b	Brown
9	MRX3_A-	RS-422A- or RS-232, input to MGC	8a	Red
10	MRX3_B+	RS-422B+ or RS-232, return to MGC	8b	Green
11	MRX4_A-	RS-422A- or RS-232, input to MGC	9a	Red

J11A terminal				
12	MRX4_B+	RS-422B+ or RS-232, return to MGC	9b	Brown
13	DISP0	Internal control	12a	Black
14	DISP1	Internal control	12b	Orange

Table 2: Sensor Unit cable connections in the JB7 Junction Box - J11B terminal

J11B terminal				
Pin	Signal		Pair no.	Colour
1	PWR-	Power supply (0 V)	1b	Blue
2	PWR+	Power supply (+24 V)	1a	White
3	RJ-1	TD+, Ethernet	4a	White
4	RJ-2	TD-, Ethernet	4b	Brown
5	RJ-3	RD+, Ethernet	6a	Red
6	RJ-6	RD-, Ethernet	6b	Blue
7	Alert	MGC alert	5a	White
8	GND	MGC ground	5b	Grey
9	XIN	Signal to MGC	10b	Grey
10	CGND	Communication ground	10a	Red
11	EOUT	Signal from MGC, 5 Volt level	11b	Blue
12	XOUT	Signal from MGC, 5 Volt level	11a	Black
13	DISP2	Internal control	13a	Black
14	VDD	5 Volt out, max. 20 mA	13b	Green

Interface Cabinet signal distribution connections Junction Box JB7

Table 3: J1 terminal in the JB7 Junction Box

J1 terminal					
Pin	Signal		Pin	Signal	
1	TX1_B+	COM1, RS-422 output	16	TX4_B+	COM4, RS-422 output
2	TX1_A-	COM1, RS-422 output	17	TX4_A-	COM4, RS-422 output
3	GND1	COM1, signal ground	18	GND4	COM4, signal ground
4	RX1_B+	COM1, RS-422 input	19	RX4_B+	COM4, RS-422 input
5	RX1_A-	COM1, RS-422 input	20	RX4_A-	COM4, RS-422 input
6	TX2_B+	COM2, RS-422 output	21	TX5_B+	COM5, RS-422 output
7	TX2_A-	COM2, RS-422 output	22	TX5_A-	COM5, RS-422 output

J1 terminal					
8	GND2	COM2, signal ground	23	GND5	COM5, signal ground
9	RX2_B+	COM2, RS-422 input	24	RX5_B+	COM5, RS-422 input
10	RX2A-	COM2, RS-422 input	25	RX5_A-	COM5, RS-422 input
11	TX3_B+	COM3, RS-422 output	26	TXP_B+	COMP, RS-422 output
12	TX3_A-	COM3, RS-422 output	27	TXP_A-	COMP, RS-422 output
13	GND3	COM3, signal ground	28	GND5	COM5, signal ground
14	RX3_B+	COM3, RS-422 input	29	PPS_B+	PPS input
15	RX3_A-	COM3, RS-422 input	30	PPS_A-	PPS input

Table 4: J2 terminal in the JB7 Junction Box

J2 terminal					
Pin	Signal		Pin	Signal	
1	R1A_GND	Replica port 1A, RS-422 ground	10	R2A_GND	Replica port 2A, RS-422 ground
2	R1A_TX_A-	Replica port 1A, RS-422 output	11	R2A_TX_A-	Replica port 2A, RS-422 output
3	R1A_TX_B+	Replica port 1A, RS-422 output	12	R2A_TX_B+	Replica port 2A, RS-422 output
4	R1B_GND	Replica port 1B, RS-422 ground	13	R2B_GND	Replica port 2B, RS-422 ground
5	R1B_TX_A-	Replica port 1B, RS-422 output	14	R2B_TX_A-	Replica port 2B, RS-422 output
6	R1B_TX_B+	Replica port 1B, RS-422 output	15	R2B_TX_B+	Replica port 2B, RS-422 output
7	R1C_GND	Replica port 1C, RS-422 ground	16	R2C_GND	Replica port 2C, RS-422 ground
8	R1C_TX_A-	Replica port 1 C, RS-422 output	17	R2C_TX_A-	Replica port 2C, RS-422 output
9	R1C_TX_B+	Replica port 1 C, RS-422 output	18	R2C_TX_B+	Replica port 2C, RS-422 output

Table 5: J3 terminal in the JB7 Junction Box

J3 terminal					
Pin	Signal		Pin	Signal	
1	R3A_GND	Replica port 3A, RS-422 ground	10	R4A_GND	Replica port 4A, RS-422 ground
2	R3A_TX_A-	Replica port 3A, RS-422 output	11	R4A_TX_A-	Replica port 4A, RS-422 output

J3 terminal					
3	R3A_TX_B+	Replica port 3A, RS-422 output	12	R4A_TX_B+	Replica port 4A, RS-422 output
4	R3B_GND	Replica port 3B, RS-422 ground	13	R4B_GND	Replica port 4B, RS-422 ground
5	R3B_TX_A-	Replica port 3B, RS-422 output	14	R4B_TX_A-	Replica port 4B, RS-422 output
6	R3B_TX_B+	Replica port 3B, RS-422 output	15	R4B_TX_B+	Replica port 4B, RS-422 output
7	R3C_GND	Replica port 3C, RS-422 ground	16	R4C_GND	Replica port 4C, RS-422 ground
8	R3C_TX_A-	Replica port 3C, RS-422 output	17	R4C_TX_A-	Replica port 4C, RS-422 output
9	R3C_TX_B+	Replica port 3C, RS-422 output	18	R4C_TX_B+	Replica port 4C, RS-422 output

Table 6: J4 terminal in the JB7 Junction Box

J4 terminal					
Pin	Signal		Pin	Signal	
1	R5A_GND	Replica port 5A, RS-422 ground	10	R6A_GND	Replica port 6A, RS-422 ground
2	R5A_TX_A-	Replica port 5A, RS-422 output	11	R6A_TX_A-	Replica port 6A, RS-422 output
3	R5A_TX_B+	Replica port 5A, RS-422 output	12	R6A_TX_B+	Replica port 6A, RS-422 output
4	R5B_GND	Replica port 5B, RS-422 ground	13	R6B_GND	Replica port 6B, RS-422 ground
5	R5B_TX_A-	Replica port 5B, RS-422 output	14	R6B_TX_A-	Replica port 6B, RS-422 output
6	R5B_TX_B+	Replica port 5B, RS-422 output	15	R6B_TX_B+	Replica port 6B, RS-422 output
7	R5C_GND	Replica port 5C, RS-422 ground	16	R6C_GND	Replica port 6C, RS-422 ground
8	R5C_TX_A-	Replica port 5C, RS-422 output	17	R6C_TX_A-	Replica port 6C, RS-422 output
9	R5C_TX_B+	Replica port 5C, RS-422 output	18	R6C_TX_B+	Replica port 6C, RS-422 output

Table 7: J5 terminal in the JB7 Junction Box

J5 terminal					
Pin	Signal		Pin	Signal	
1	R7A_GND	Replica port 7A, RS-422 ground	10	R8A_GND	Replica port 8A, RS-422 ground
2	R7A_TX_A-	Replica port 7A, RS-422 output	11	R8A_TX_A-	Replica port 8A, RS-422 output
3	R7A_TX_B+	Replica port 7A, RS-422 output	12	R8A_TX_B+	Replica port 8A, RS-422 output
4	R7B_GND	Replica port 7B, RS-422 ground	13	R8B_GND	Replica port 8B, RS-422 ground
5	R7B_TX_A-	Replica port 7B, RS-422 output	14	R8B_TX_A-	Replica port 8B, RS-422 output
6	R7B_TX_B+	Replica port 7B, RS-422 output	15	R8B_TX_B+	Replica port 8B, RS-422 output
7	R7C_GND	Replica port 7C, RS-422 ground	16	R8C_GND	Replica port 8C, RS-422 ground
8	R7C_TX_A-	Replica port 7C, RS-422 output	17	R8C_TX_A-	Replica port 8C, RS-422 output
9	R7C_TX_B+	Replica port 7C, RS-422 output	18	R8C_TX_B+	Replica port 8C, RS-422 output

Table 8: J6 terminal in the JB7 Junction Box

J6 terminal					
Pin	Signal		Pin	Signal	
1	RL1_NC	Relay 1, normally closed	11	AGND	Analog ground
2	RL1_C	Relay 1, common	12	ANA1	Analog 1, output
3	RL1_NO	Relay 1, normally open	13	AGND	Analog ground
4	RL2_NC	Relay 2, normally closed	14	ANA2	Analog 2, output
5	RL2_C	Relay 2, common	15	AGND	Analog ground
6	RL2_NO	Relay 2, normally open	16	ANA3	Analog 3, output
7	232_TX	RS-232, transmit	17	AGND	Analog ground
8	232_GND	RS-232, ground	18	ANA4	Analog 4, output
9	232_RX	RS-232, receive	19	RL3_C	Relay 3, common
10	RL3_NO	Relay 3, normally open	20	RL3_NC	Relay 3, normally closed

Related references

[Interface cabinet internal arrangement](#), page 41

Related topics

[Cabling between Sensor Unit and Interface Cabinet](#), page 26

Drawings

Topics

[Sensor Unit dimensions, page 36](#)

[Adapter dampening plate dimensions, page 37](#)

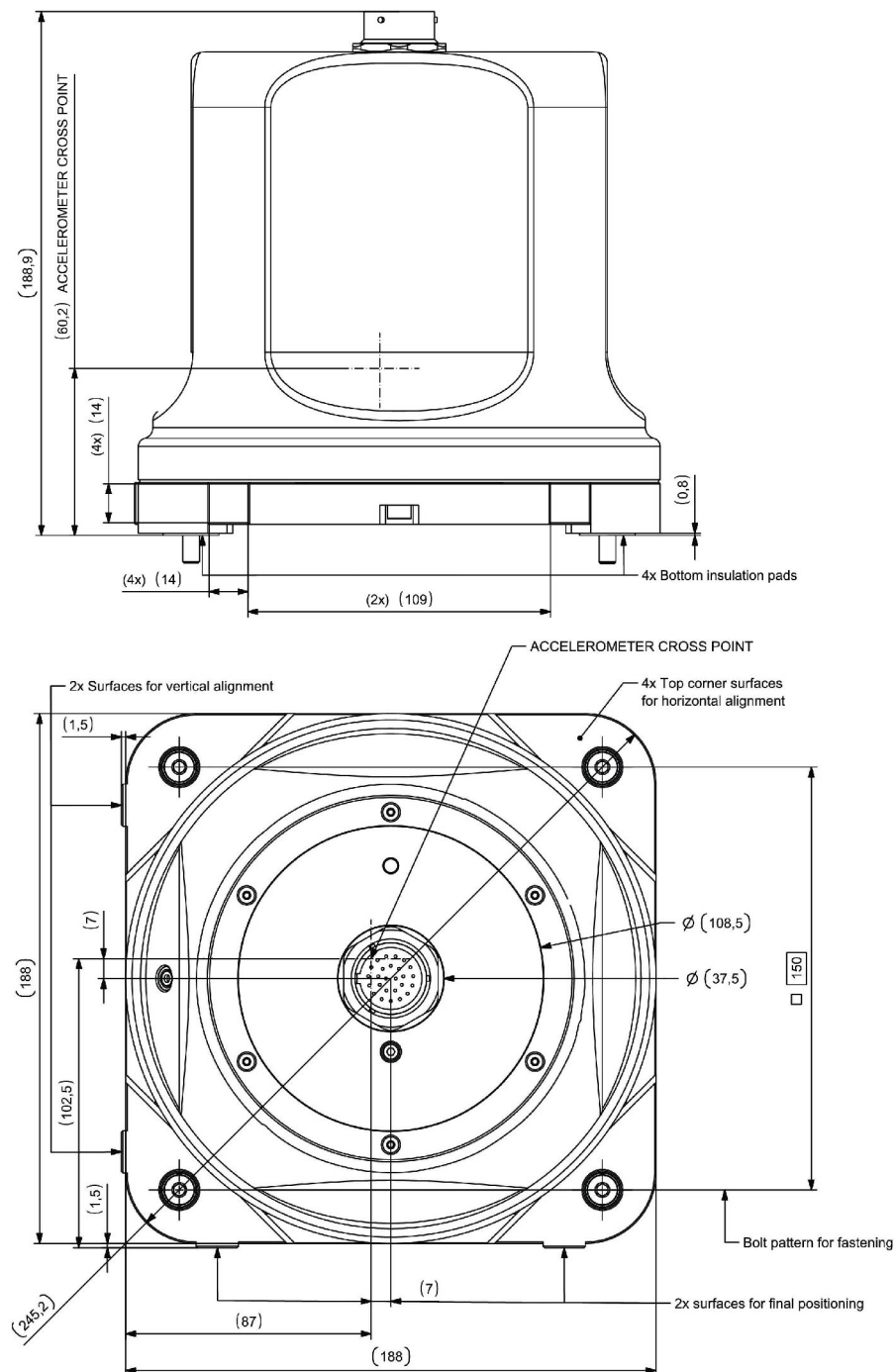
[Cabinet dimensions, page 38](#)

[MGC JB7 Junction Box wiring inside cabinet, page 39](#)

[Power wiring, page 40](#)

[Interface cabinet internal arrangement, page 41](#)

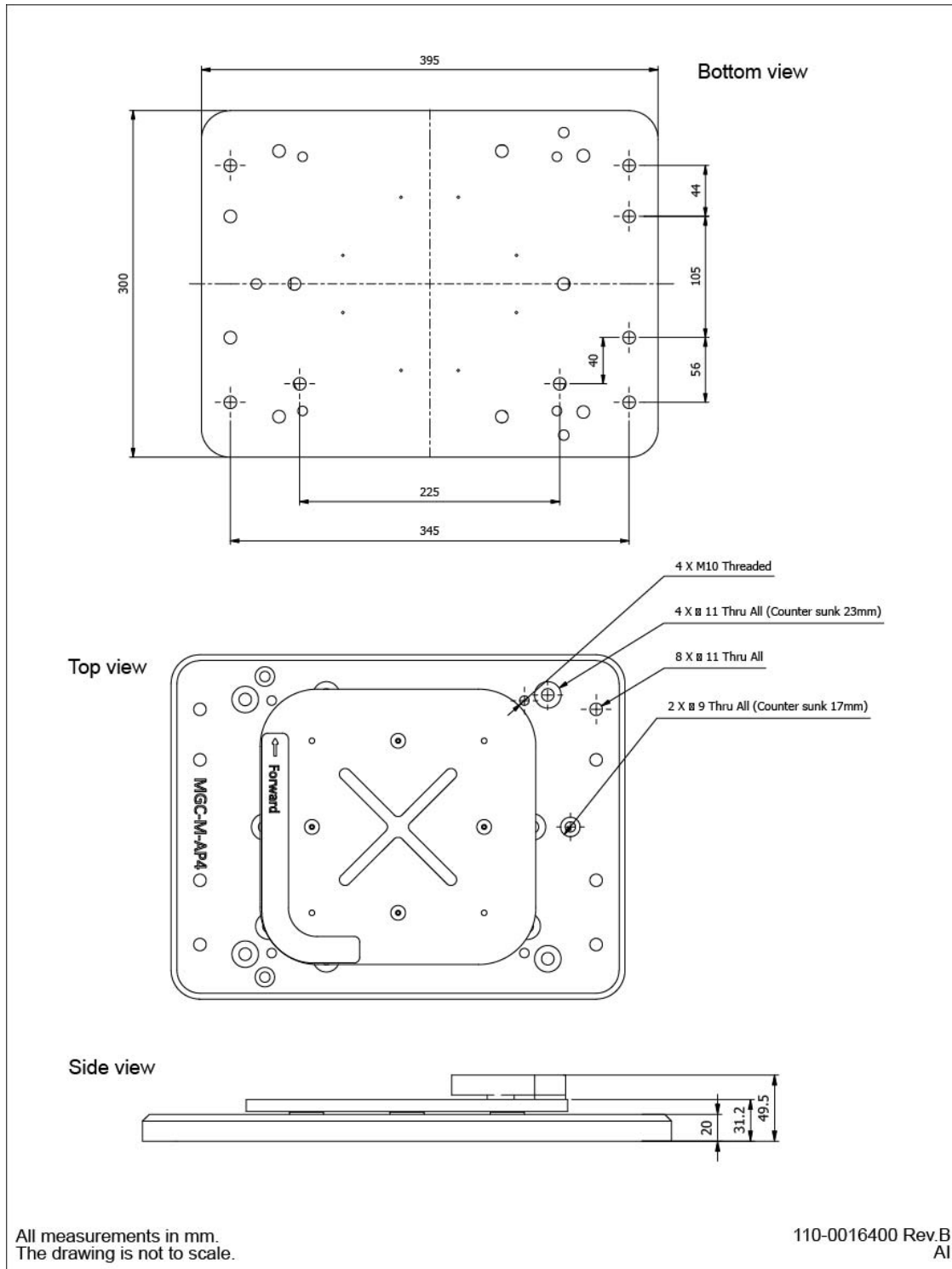
Sensor Unit dimensions



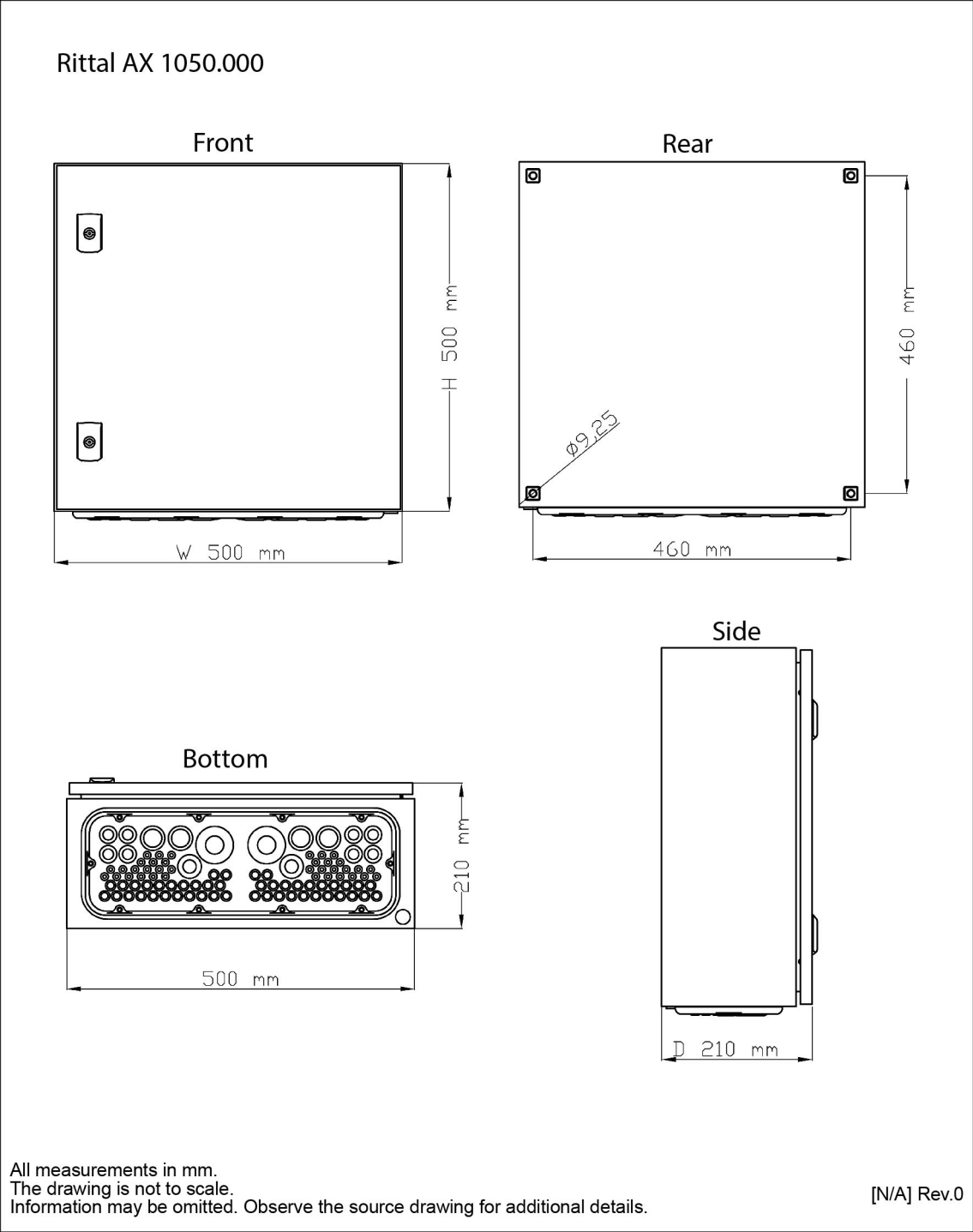
All measurements in mm.
The drawing is not to scale.
Information may be omitted. Observe the source drawing for additional details.

3800-MA-411 Rev.07

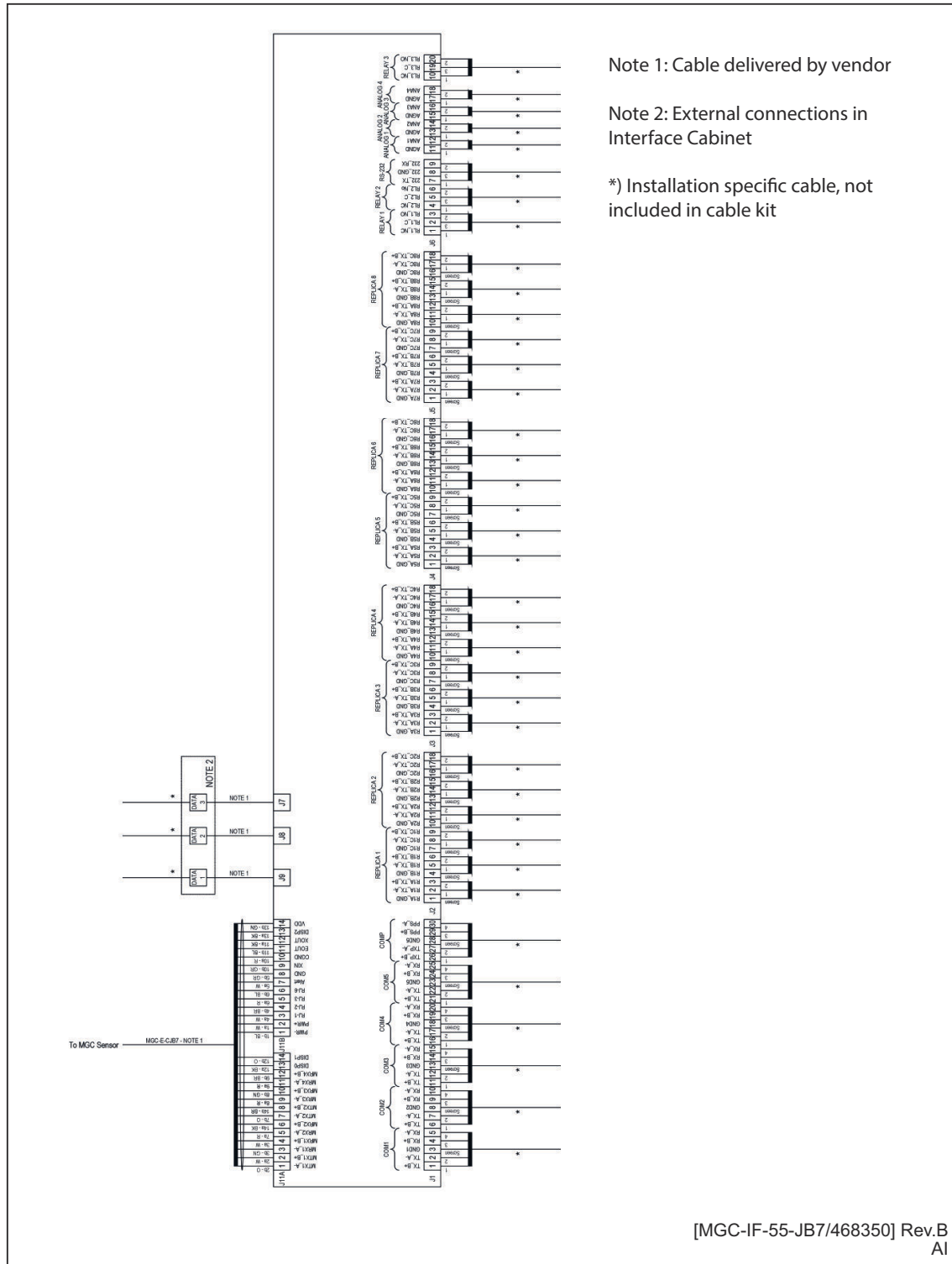
Adapter dampening plate dimensions



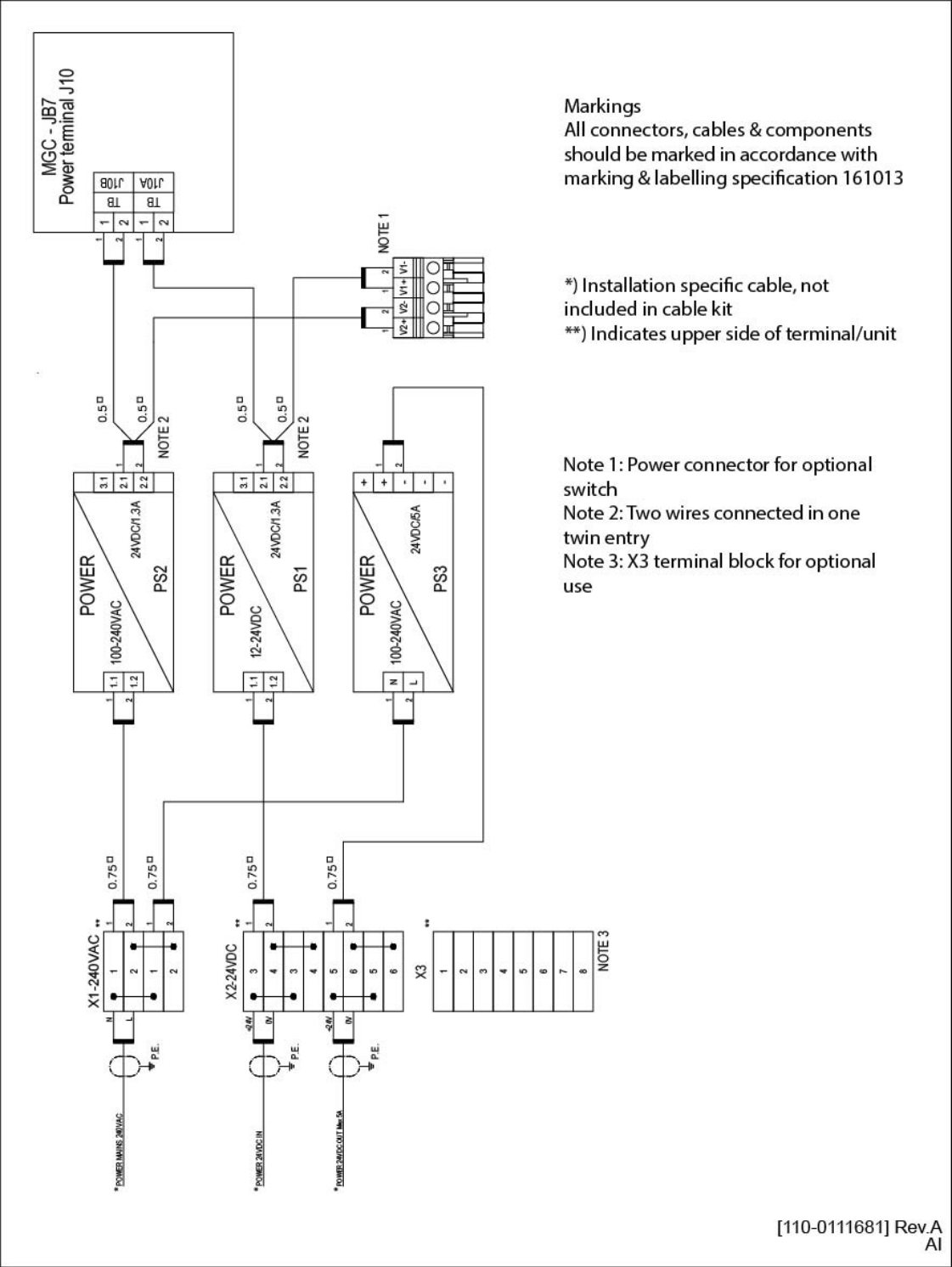
Cabinet dimensions



MGC JB7 Junction Box wiring inside cabinet



Power wiring



Technical specifications

Topics

[Weights and outline dimensions, page 42](#)

[Power specifications, page 43](#)

[Environmental specifications, page 43](#)

[Interface specifications, page 44](#)

[Cable specifications, page 45](#)

[Standards and regulations, page 45](#)

Weights and outline dimensions

Sensor Unit

- **Outline dimensions:**
 - **Length:** 189.5 mm
 - **Width:** 189.5 mm
 - **Height:** 188.9 mm
- **Weight:** 8 kg
- **Connector type:** Souriau 851–36RG 16–26S50 (MIL spec.)

MGC adapter dampening plate

- **Outline dimensions:**
 - **Length:** 395 mm
 - **Width:** 300 mm

- **Height:** 44.7 mm
- **Weight:** 7.7 kg
- **Material:** Aluminium

Interface Cabinet

- **Outline dimensions:**
 - **Height:** 500 mm
 - **Width:** 500 mm
 - **Depth:** 210 mm
- **Weight:** 18.2 kg

Power specifications

Sensor Unit with Interface Cabinet

- **Input voltage 1:** 100 - 240 V AC
- **Input voltage 2**
: 24 V DC nominal (18 - 32 V DC)
- **Power consumption:** 20 W
- **Uninterruptible power supply (UPS):** Not integrated. Connection to UPS recommended. UPS required for high-speed craft.

Environmental specifications

Sensor Unit

- **Operating temperature:** -15 °C – 55 °C
- **Storage temperature:** -35 °C – 70 °C
- **Storage humidity:** Sealed
- **Ingress protection (IP) code:** IP66
- **Enclosure material:** Anodised aluminium
- **Max shock non-operational:** 1000 m/s² (10 ms peak)
- **MTBF (hours):** 50000 h (computed)

- **MTBF (hours):** 100000 h (service history based)

Interface Cabinet

- **Ambient temperature range:** -20 °C - 55 °C
- **Storage temperature:** -20 °C - 55 °C
- **Relative humidity:** < 50 % at +40 °C (higher humidity levels are permitted at lower temperatures)
- **Storage humidity:** < 50 % at +40 °C (higher humidity levels are permitted at lower temperatures)
- **Ingress protection (IP) code:** IP66
- **Enclosure material:** Sheet steel

Interface specifications

- **COM 1 - COM 5:** Serial port, bidirectional RS-422 (IEC 61162)
- **PPS COM:** PPS port input RS-422
- **Replica ports:** 8 ports, 3 outputs on each port, RS-422
- **Baud rate COM 1 – COM 5:** 115200 baud, max.
- **Baud rate replica ports:** Aligned with COM1 - COM5
- **Ethernet:** 3 x 10/100 Mbps
- **UDP/IP ports:** 5 outputs (user configurable), 1 output (static)
- **Data output variables (for each output):** 24, max. (serial line or Ethernet port)
- **Data output rate:** 200 Hz, max.
- **Timing accuracy:** 1 ms
- **Data delay:** Typical 3.5 ms plus transmission delay
- **Data output:** Cyclic output of data or by request from host computer
- **Fanout:** Typical 10
- **Input impedance:** Open-ended/120 Ohm (optional)

Cable specifications

Sensor Unit cable

- **Type:** MGC-E-CJB7, Heavy duty screened, 14 x 2 x 0.25 mm²
- **Length:** 3 m
- **Diameter:** 13.5 mm
- **Weight:** 0.27 kg/m
- **Flame retardation:** IEC 60332-1
- **Insulation:** PP (conductors), PUR (outer cover)
- **Screen:** Cu-braid

Standards and regulations

This product is in compliance with relevant directives and product standards.

Sensor Unit

- Environmental standards:
 - IEC 60945, 4th edition
- Product safety standards:
 - IEC 61010-1

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