AP300 All Types

Installation Manual

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Great care has been taken to ensure that the information contained in this handbook is accurate and complete. Should any errors or omissions be discovered or should any user wish to make a suggestion for improving this handbook, he is invited to send the relevant details to:

NEC Unified Solutions
P.O. BOX 32
1200 JD HILVERSUM
THE NETHERLANDS

Important

The equipment described in this manual should be installed and maintained only by professional and qualified engineers in accordance with the procedures and instructions described in this manual.

Regulatory information European Union

Declaration of Conformity

Hereby, “NEC Unified Solutions”, declares that this “AP300” is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

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Product disposal information

The symbol depicted here has been affixed to your product in order to inform you that electrical and electronic products should not be disposed of as municipal waste.

Electrical and electronic products including the cables, plugs and accessories should be disposed of separately in order to allow proper treatment, recovery and recycling. These products should be taken to a designated facility where the best available treatment, recovery and recycling techniques are available. Separate disposal has significant advantages: valuable materials can be re-used and it prevents the dispersion of unwanted substances into the municipal waste stream. This contributes to the protection of human health and the environment.

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- Reorient or relocate the equipment.
- Increase the separation between the equipment and receiver.
- Consult the dealer or an experienced radio/TV technician for help."

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Exposure to Radio Frequency (RF) Signals:

This base station is a radio transmitter and receiver. It is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the OET Bulletin 65 Supplement C. These limits are part of comprehensive guidelines and establish permitted levels of RF energy for the general population. The guidelines are based on the safety standards previously set by international standards bodies. These standards include a substantial safety margin designed to assure the safety of all persons, regardless of age and health.

This device with internal antennas must provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

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CONTENTS

PREFACE

This manual is applicable for the AP300, DECT Transceiver.

Please note that some product models or features described in this manual may not be available in all world regions."

No legal rights can be obtained from information in this manual.

1. AP300 GENERAL

1.1. GENERAL

This installation Manual is valid for installing a DECT transceiver (AP300) to a wall in horizontal or vertical position. The AP300 is designed for indoor use. When installing an AP300 outdoors, please use the dedicated Outdoor Cabinet:

Note that there are two types of DECT Tranceivers::

- **AP300** (with internal antennas).
- **AP300E** with directional antenna.

Note: *The AP300**E** must always be installed/used in the outdoor cabinet! For more information consult the manual for the Outdoor Cabinet for AP300.*

1.2. COUNTRY SELECTION

The AP300 is equipped for EMEA, Latin America and North America. However, the DAP Controller determines the frequency used and the power level. The DAP Controller is the software that runs on a PC to control the AP300.

There are three types of DAP Controllers available for the AP300:

- **DAP Controller – International**.
  This version is used in EMEA countries and countries that use the European frequencies and power levels.

- **DAP Controller - North America**
  This version is used in North America.

- **DAP Controller - Selective Countries**.
  This version is used in countries with other frequency ranges than EMEA or North America

Note: *In North America, only the "DAP Controller - North America" will be delivered, so no other frequencies than the North America frequencies and power levels are possible in North America.*

Note: *In Europe, only the "DAP Controller - International" will be delivered, so no other frequencies than the European frequencies and power levels are possible in Europe.*

1.3. SITE REQUIREMENTS

Usually the Cabinets will be fixed to existing walls in the positions determined by the Site Survey.

Do not mount the AP300 to a metal wall!

1.4. TEMPERATURE RANGES

The temperature range of the AP300 is:

- 0° to 45° C.

The outside temperature range for the AP300 (all types) mounted in the Outdoor Cabinet is as follows:

Minimum outside temperature: -20° C
Maximum outside temperature: 45° C

1.5. CABLE SPECIFICATIONS FOR AP300 Types

The cabling to the AP300(E) is “Category 5” Ethernet cabling. The interface is defined as an SELV interface according EN60950-1. For this reason the following safety restriction is applicable:

Caution: *The cabling and/or the AP300(E) may never be exposed to over-voltages (e.g. lightning). Therefore, the AP300(E) and cabling associated with it may never be installed outdoors! However there is an exception: if installed in the Outdoor Cabinet, and the Outdoor Cabinet is mounted against a wall* ***and*** *the cable is led directly indoors, it is permitted. For details about this specific installation refer to the installation manual of the Outdoor Cabinet.*

The power for the AP300(E) must be supplied via the Ethernet cable, PoE (IEEE 802.3af). There is no room for a Mains Power adaptor inside the Outdoor Cabinet.

1.6. G.729 DAUGHTER BOARD

The AP300 does support the G.729 codec, but only if the G.729 Daughter Board is installed.

If the G.729 Daughter Board is not installed, the AP300 supports only G.711u law or G.711a law.
Installation of the Daughter Board is described in chapter 4. MOUNTING THE G.729 DAUGHTERBOARD.

1.7. VISUAL CHECK

The equipment must be carefully unpacked and examined for any visible sign of damage.

Anything not in order should be reported back to the supplier, as soon as possible, to avoid delays during installing due to missing equipment.

1.8. HORIZONTAL OR VERTICAL MOUNTING

The AP300 can be mounted horizontally or vertically. When mounting vertically, you don't need top change the antenna position.

Figure 1. AP300 in vertical position.

When the AP300 must be mounted horizontally, the antenna position must be changed.

Figure 2. AP300 mounted horizontally

1.9. INSTALLATION PROCEDURES

The installation of an Outdoor Cabinet comprises the installation of:

- Adjusting the Antenna position (if necessary).
- Mounting the G.729 Daughter Board (if applicable)
- Mounting the AP300 against the wall.
- Connecting directional antennas.

2. UNPACKING

Procedure for unpacking.

1. Open the card board box and take the AP300 out.

2. Check the AP300 on any damages.

3. Continue with one of the following Chapters:

   – When you mount the AP300 vertically, the antenna position will normally be OK, and when you do not need to install the G.729 Daughter Board, continue with Chapter 5 MOUNTING THE AP300 AGAINST A WALL.

   – When you mount the AP300 horizontally, you probably need to change the antenna position. Consult Chapter 3. ADJUSTING THE ANTENNA POSITION.

   – When you require G.729 codec support, you will have to install the G.729 Daughter Board. Consult Chapter 4. MOUNTING THE G.729 DAUGHTERBOARD

3. ADJUSTING THE ANTENNA POSITION

Note: *You only need to change the antenna position when you mount the AP300 horizontally! In all other cases you don't need to change the antenna position.*

Figure 3. AP300 mounted horizontally

Procedure for Adjusting the Antenna position.

Note: *Antenna position can be changed once. You should not change it back!*

1. Remove the two screws from the rear side of the cabinet

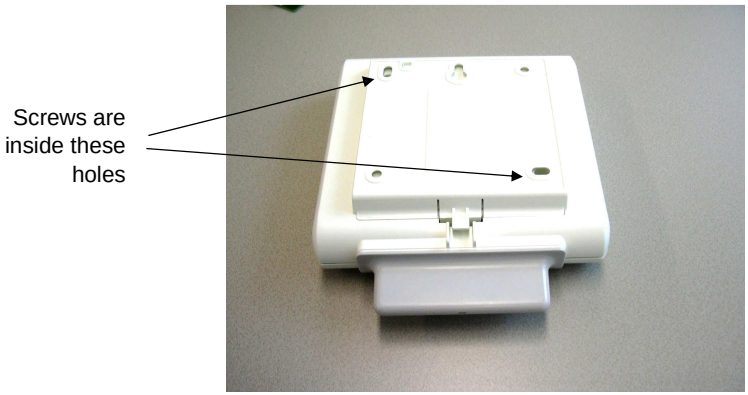

Figure 4. Rear side of Cabinet.

2. Open the cabinet CAREFULLY! Make sure that you shift the cover of the antenna's carefully from the antenna's.

3. Take the antenna cover from the AP300 cover.

4. To put the antennas in vertical position, bend them ***carefully*** as shown in Figure 5. Bend Antennas carefully into vertical position.

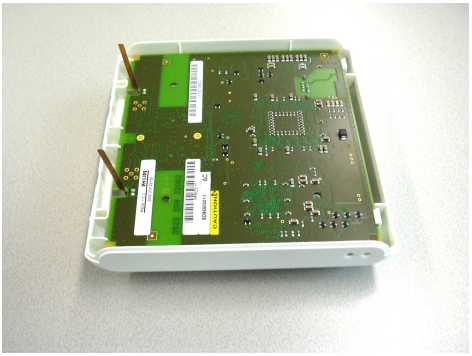

Figure 5. Bend Antennas carefully into vertical position.

5. After the antennas are put in the vertical position, close the AP300 cabinet again. In other words, put the AP300 cover back into position and secure the screws at the rear side of the cabinet. See Figure 6. Antennas locked into Cover.

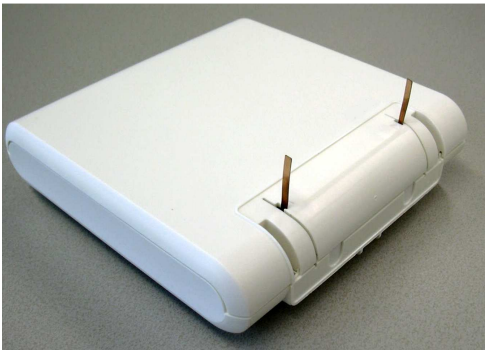

Figure 6. Antennas locked into Cover.

6. Make sure that the antennas are properly locked into the locks in the AP300 cover.

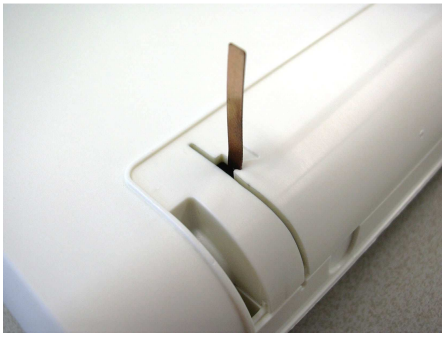

Figure 7. Detail of antenna in lock.

7. Move the antenna cover carefully over the antennas in the vertical position and make sure that the antennas do not bend. When the antenna cover is in its position, push it further into its position in the AP300 cabinet to fix it.

Figure 8. Cover installed.

8. Now your AP300 is ready to be installed.

4. MOUNTING THE G.729 DAUGHTERBOARD

Follow the step-by-step procedure below, to install the G.729 daughter board.

1. Make sure that you have the G.729 Daughter board.
2. Open the cabinet. Use steps 4 till 6 in Chapter 3
3. Take the PWB out of the cabinet.

   Note: *Mind the light conductor for the LEDs. It can drop off!*

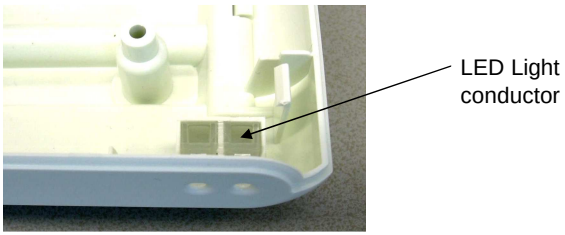

Figure 9. Light conductor for LEDs

4. Now you should have the AP300 PWB and the G.729 Daughter Board as separate items.
5. Remove the protection foil from the sticky part on the G.729 Daughter Board.

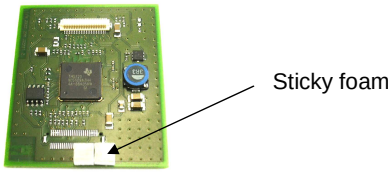

Figure 10. G.729 Daughter Board with sticky foam

6. Mount the G.729 Daughter Board onto the main PWB. Push the Daughter Board carefully onto the main board. The white connector should fit well. Make sure that the sticky part sticks to the Main Board.

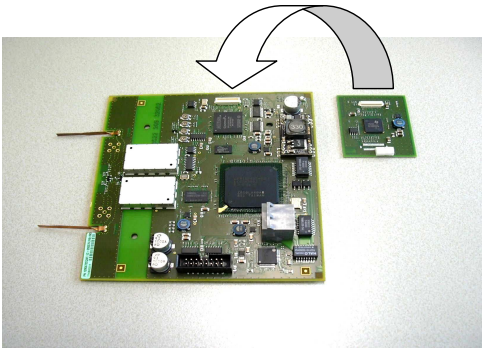

Figure 11. Mounting the G.729 Daughter Board onto the Main board.

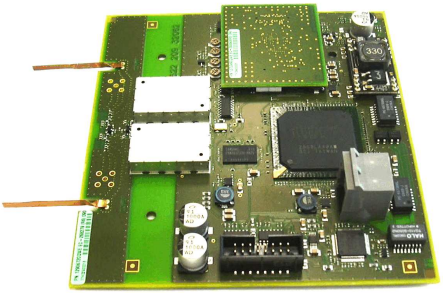

Figure 12. G.729 Daughter Board on the Main Board

7. Put the AP300 together in the opposite way, mounting the PWB into the cabinet and assembling the cabinet. Do not forget to mount the two screws back into the rear side of the cabinet.

5. MOUNTING THE AP300 AGAINST A WALL

Procedure for mounting the AP300 to the wall:

1. Remove the mounting plate from the AP300 cabinet.

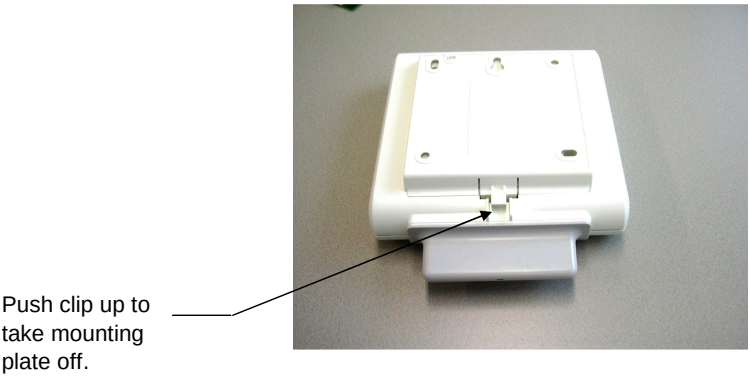

Figure 13. How to take the mounting plate off.

2. Mount the mounting plate to the wall.

Figure 14. Mounting plate..

3. Make sure that the CAT 5 cable to the cabinet has the correct length.

4. If necessary, mount the RJ45 connector to the cable using the tool for mounting an RJ45 connector plug to a Category 5 cable. For standard colour schemes, consult Chapter 7. WIRE COLOUR CODING FOR CATEGORY 5 CABLES.

5. Lead the Cat 5 cable to the AP300 cabinet and connect the RJ45 connector. Push the cable into the groove.

Figure 15. Cable at rear side of the cabinet.

6. Push the cabinet onto the mounting plate.

Note: *When pushing the AP300 on to the mounting plate, make sure that you hear/feel a distinct click. This indicates that the AP300 is firmly mounted to the mounting plate.*

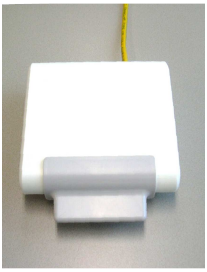

Figure 16. AP300 mounted against the wall.

1.

6. LEDs

6.1. LED Status

The AP300 is equipped with two LEDs.

Top LED – Yellow

This LED represents the status of the AP300. The indications are equal to the status indication on the AP300 LED.

LED Status (Top LED, Yellow)	Meaning
Off	No power
0,5 seconds On - 0,5 seconds Off	Loading software/firmware
Short flash every 0,25 seconds	IP Network error (not connected, no DHCP/TFTP server, no DAP Controller
Fast blink	DAP operational, but trying to synchronize to another DAP
Continuous fast blink	Hardware error
Steady On	DAP operational (and synchronized to other DAP or is the synchronization master).

Table 1. AP300 LED Status on top LED

Lower LED – Red/Green

This LED is used to indicate the start-up and network status.

LED Status (lower LED, Red/Green)	Meaning
RED Steady on	Power but FPGA starting up
RED flashing	Trying to connect to the network
Green flashing	Network status display and showing network activity
Off	AP300 operational

Table 2. Lower LED status on the AP300.

6.2. LED Colours

The colour of the ***top*** LED might be different depending on the operational mode. The following operational modes are distinguished:

- **Normal (single band) mode**
  In the normal single band mode, the top LED will be Yellow.

- **Dual Band Mode**
  In Dual Band mode, the LED colour shows the operational frequency:
  - Green .... : Europe/International
  - Red ..... : North America / USA

- **Site Survey mode** (only applicable for the AP300 in the Site Survey Kit.)
  - Green .... : Europe/International
  - Red ..... : North America / USA
  - Blue ..... : Latam
  - Magenta . : China and Thailand

7. WIRE COLOUR CODING FOR CATEGORY 5 CABLES

This chapter shows you the normal colour coding for category 5 cables (4 pair) based on the two standards supported by TIA/EIA: the 568A and 568B standard. These standards apply to the colour code used with a *single* cable run: BOTH ENDS MUST USE THE SAME STANDARD. Which standard to use is a matter of local decision. However, since they both use the same pin out at the connectors you can mix 568A and 568B cables in any installation.

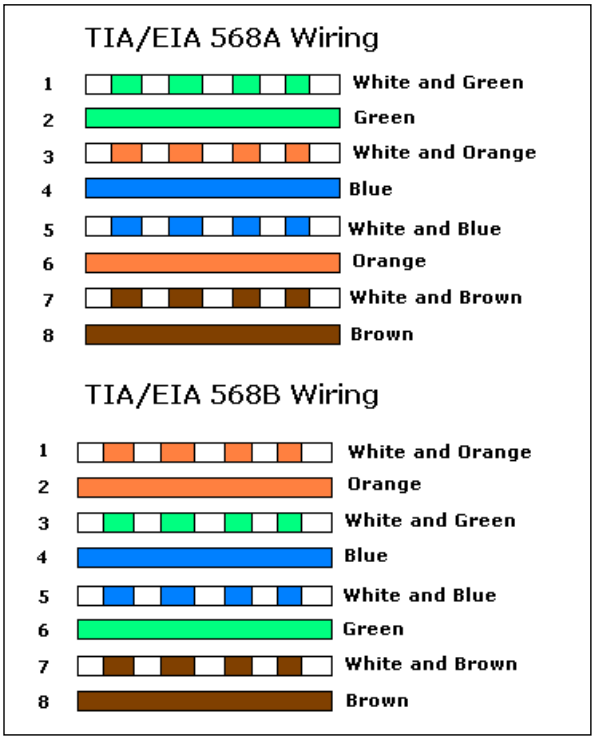

Figure 17 Colour Schemes for Wires in Category 5 Ethernet Cabling.

8. SPECIFICATIONS

Dimensions / Environment:

- Dimensions (W x D x H) ..... : 145 x 43 x 174
- Outside temperature range... : 0° C . . . 45° C
- IP Specification ..... : In Outdoor Box = IP66
- Relative Humidity..... : 5 . . . 95 %

PoE Specifications:

- Voltage at AP300 via PoE ... : 36 . . . . 57 V. DC
- PoE Class..... : Class 2
- Power Consumption ..... : 6 Watt maximum

IP Specifications:

- IP Network..... : 10/100Base-T IEEE802.3
- Connector:..... : RJ45
- Cable ..... : Cat 5 UTP or better
- IP Version..... : IPv4
- DHCP/TFTP support..... : Yes
- Quality of Service..... : IEEE802.1Q, IEEE802.1P

Audio Algorithm:

- AP300:..... : G.711
- AP300 with Daughter Board . : G.711 and G.729

Country/Region support:

- EMEA ..... : 1880 – 1900 Mhz
- Latin America..... : 1910 – 1930 MHz
- North America..... : 1920 – 1930 MHz (3 dB lower output power)

Note: *Country selection is determined by the DAP Controller Type! See section 1.2* COUNTRY SELECTION.

Outdoor Cabinet Isolated

For AP300 (all types)

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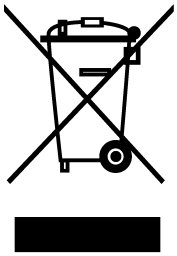

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Privacy of communications may not be ensured when using this equipment.

CONTENTS

1. GENERAL REMARKS

This installation Manual is valid for installing a DECT transceiver (AP300) in an Outdoor Cabinet. The Outdoor Cabinet is designed for the following transmitter/receiver (transceiver) types:

- DAP (DECT Access Point) types: AP300 (with internal antennas).
- DAP types: AP300E with directional antenna.

1.1. TOOLING

The following tools are required for the installation:

- An ordinary set of tools, comprising such things as screwdrivers and pliers.
- A drill for fixing a Cabinet to a wall.
- A drill for drilling a hole in the cabinet for the cable swivel. This drill must be 12 mm.
- A tool for mounting an RJ45 connector to the “Category. 5” Ethernet cable.
- An SMA Torque Wrench for securing the coax connector nuts (only in case of the AP300E with external (directional) antenna).
- A sharp knife for cutting the foam in the Outdoor box (only in case of the AP300E with external directional antenna).

The following installation materials are needed:

- Four screws to mount the cabinet to the wall.
- If mounted to a brick wall or plaster wall, make sure you have four correct “plugs” where the screws fit into.
- RJ45 connector plug.

1.2. SITE REQUIREMENTS

Usually the Cabinets will be fixed to existing walls in the positions determined by the Site Survey.

1.3. TEMPERATURE RANGES

The outside temperature range for the AP300 (all types) mounted in the Outdoor Cabinet is as follows:

Minimum outside temperature: -20° C
Maximum outside temperature: 45° C

1.4. CABLE SPECIFICATIONS FOR AP300 Types

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Caution: *The cabling and/or the AP300(E) may never be exposed to over-voltages (e.g. lightning). Therefore, the AP300(E) and cabling associated with it may never be installed outdoors! However there is an exception: if installed in the Outdoor Cabinet, and the Outdoor Cabinet is mounted against a wall* ***and*** *the cable is led directly indoors, it is permitted.*

The power for the AP300(E) must be supplied via the Ethernet cable, PoE (IEEE 802.3af). There is no room for a Mains Power adaptor inside the Outdoor Cabinet.

1.5. VISUAL CHECK

The equipment must be carefully unpacked and examined for any visible sign of damage.

Anything not in order should be reported back to the supplier, as soon as possible, to avoid delays during installing due to missing equipment.

1.6. INSTALLATION PROCEDURES

The installation of an Outdoor Cabinet comprises the installation of:

- Fixing the Cabinet to a wall.
- Installing the AP300(E) in the Cabinet.
- Connecting the Ethernet cable.

2. INSTALLING AP300 WITH INTERNAL ANTENNAS

Procedure for installing the Outdoor Box with AP300 with internal antennas:

1. Open the Cabinet. To open the cabinet, use a screw driver that fits into the four plastic screws at the front side of the cabinet. Unfasten the screws.

2. Remove the cover from the cabinet. The contents of the cabinet is shown in Figure 1. Contents of the box.

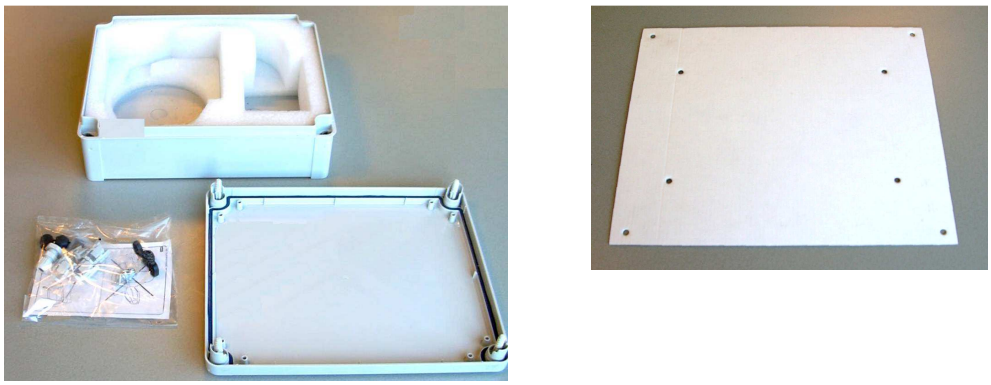

Figure 1. Contents of the box.

3. Remove the foam contents from the cabinet.

4. At the right hand side of the cabinet, you will have to drill a hole for the cable inlet. Mark the hole as follows:

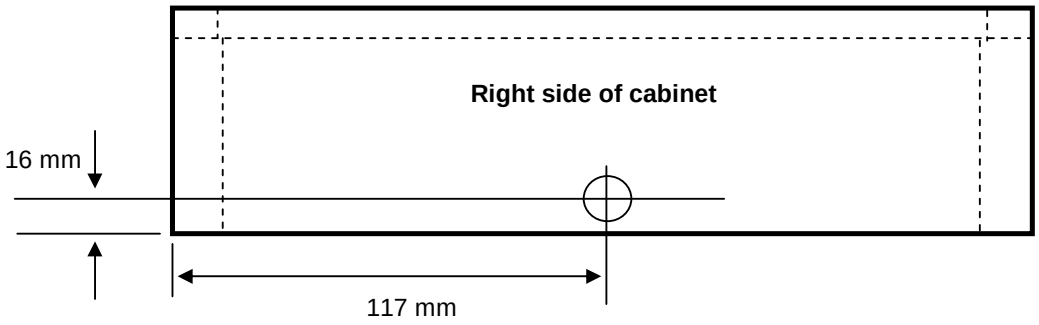

Figure 2. Position of the hole in the cabinet.

5. Drill a hole for the swivel. Use a 12 mm drill.

Figure 3. Drilling the hole (12 mm)

6. Mount the swivel in the hole that you have drilled. *Do not forget to install the rubber ring to seal the conjunction between the swivel and the cabinet. The conjunction must be waterproof.*

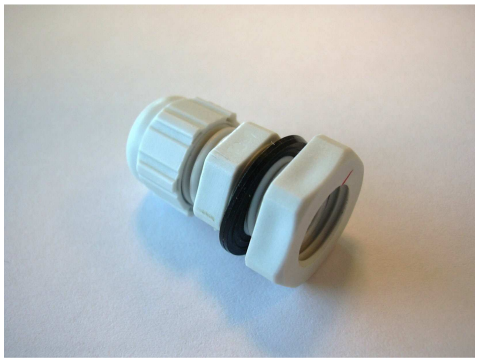

Figure 4. Swivel with black rubber ring.

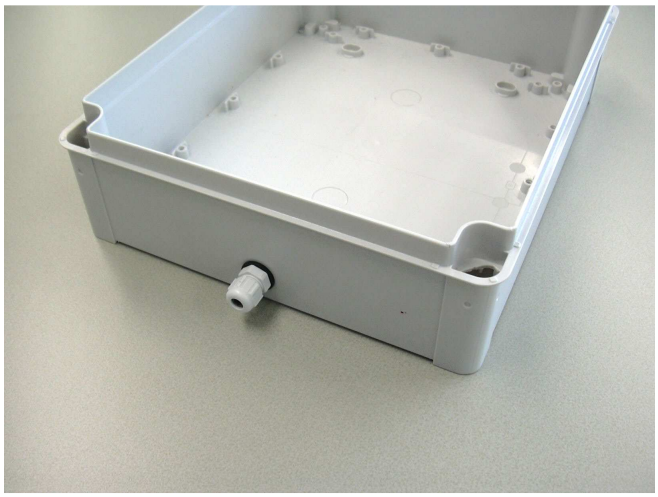

Figure 5. Swivel mounted to the cabinet.

7. Put the foam back into the cabinet.

8. Keep the cabinet in the correct position against the wall and mark the mounting holes in the corners of the cabinet on the wall. If necessary use the template that was delivered with the cabinet.

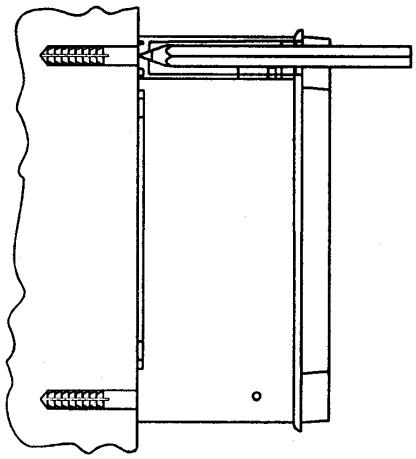

Figure 6. Marking the corner holes on the wall.

9. Drill the holes in the wall using an appropriate drill that is applicable for the wall.

10. Mount the cabinet to the wall. Use appropriate screws and plugs.

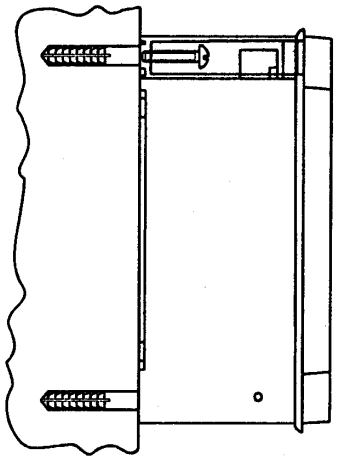

Figure 7. Mounting the cabinet to the wall.

11. Push the special nuts that came with the cabinet into the corner holes of the cabinet.

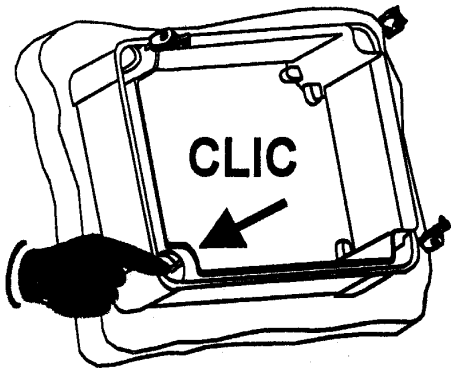

Figure 8. Pushing the special nuts in place in the corners of the cabinet.

12. Lead the cable via the swivel into the cabinet. Note: the cable length in the cabinet must be 20 cm (this includes the RJ45 connector which you have to mount to the cable later on.).

    Note: *At the outside of the box, the cable must be led directly from the cabinet into the building to avoid exposing the cable to lightning.*

13. Tighten the cable inlet on the swivel and make sure that the cable inlet is waterproof.

14. Lead the cable to the AP300 and mount the RJ45 connector to it using the tool for mounting an RJ45 connector plug to a Category 5 cable. For standard colour schemes, consult Chapter 4. WIRE COLOUR CODING FOR CATEGORY 5 CABLES.

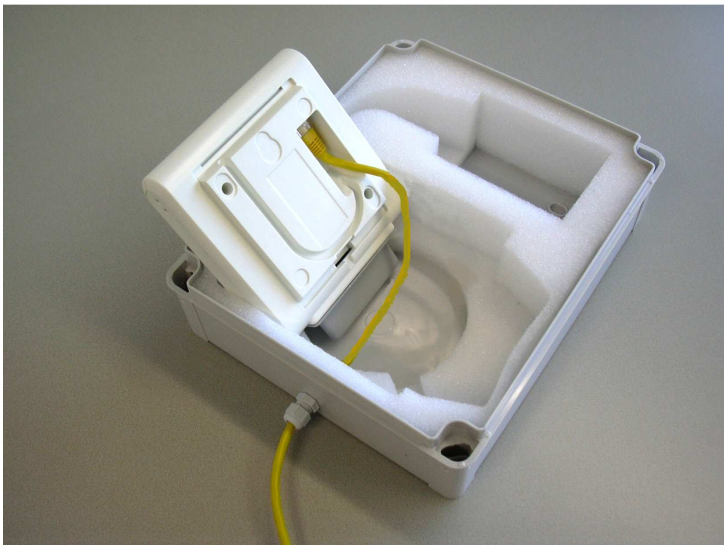

Figure 9. Cable run in the Cabinet.

15. If not yet done, connect the RJ45 connector to the AP300 (at the rear side) and push the Category 5 Ethernet cable into the round foam-free area in the rear side of the cabinet.

16. Push the AP300 into its position in the foam.

Figure 10. AP300 in it's position in the cabinet.

17. Mount the cover of the cabinet onto the cabinet with the four plastic screws in each corner of the cover. The cabinet is now closed.

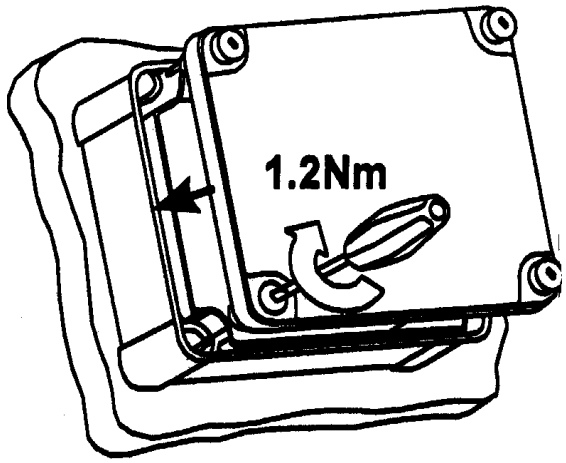

Figure 11. Mounting the cover.

3. INSTALLING A DAP/RFP WITH EXTERNAL ANTENNAS

Before you start installing the cabinet, make sure that you have the installation materials as described in Section 1.1 TOOLING

Also make sure that you have the AP300E version together with the Directional antenna and two equal cables for connecting the directional antenna to the AP300E.

Procedure for installing the Outdoor Box with AP300E with directional antenna:

1. Open the Cabinet. To open the cabinet, use a screw driver that fits into the four plastic screws at the front side of the cabinet. Unfasten the screws.

2. Remove the cover from the cabinet. The contents of the cabinet is shown in Figure 12. Contents of the box.

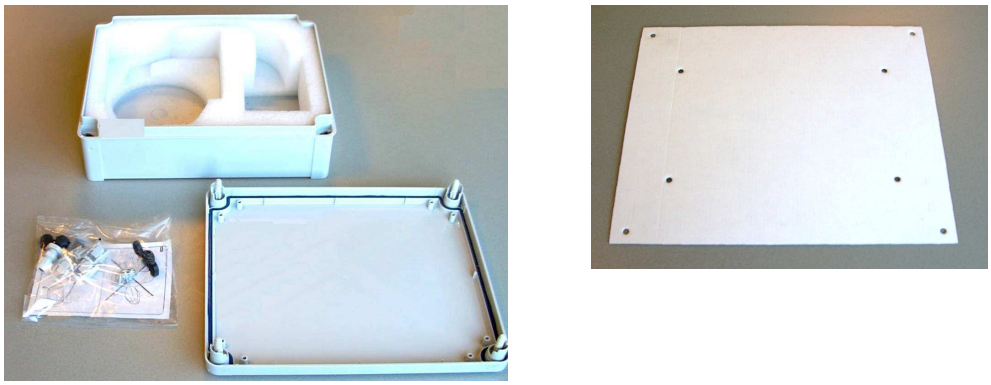

Figure 12. Contents of the box.

3. Remove the foam contents from the cabinet.

4. At the right hand side of the cabinet, you will have to drill a hole for the cable inlet. Mark the hole as follows:

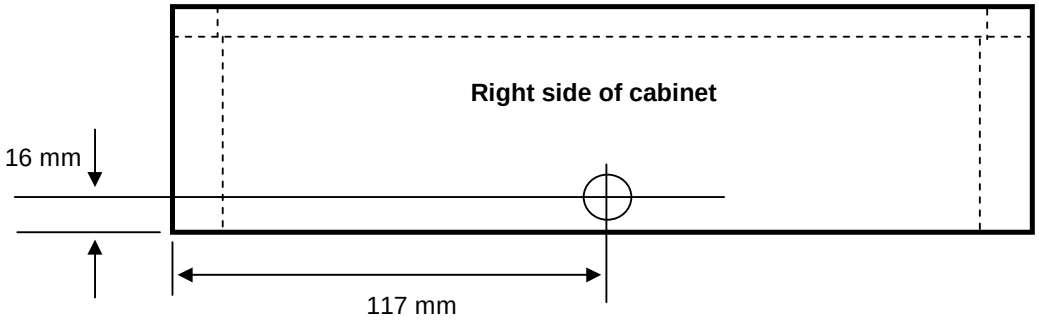

Figure 13. Position of the hole in the cabinet.

5. Drill a hole for the swivel. Use a 12 mm drill.

Figure 14. Drilling the hole (12 mm)

6. Mount the swivel in the hole that you have drilled. *Do not forget to install the rubber ring to seal the conjunction between the swivel and the cabinet. The conjunction must be waterproof.*

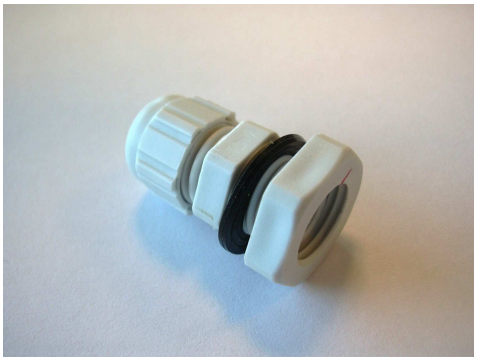

Figure 15. Swivel with black rubber ring.

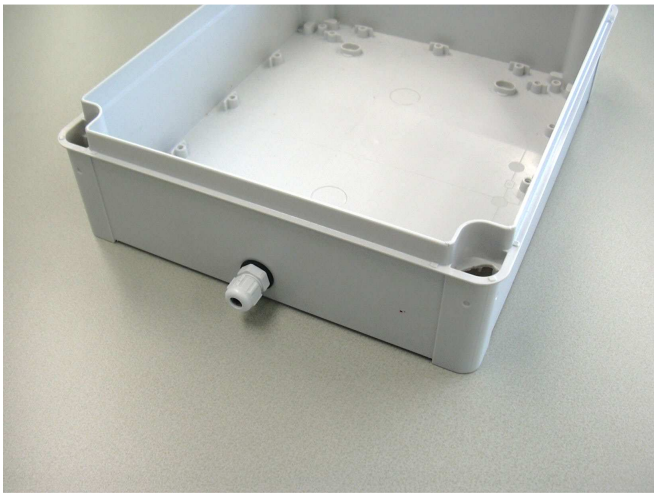

Figure 16. Swivel mounted to the cabinet.

7. Put the foam back into the cabinet.

8. Keep the cabinet in the correct position against the wall and mark the mounting holes in the corners of the cabinet on the wall. If necessary use the template that was delivered with the cabinet..

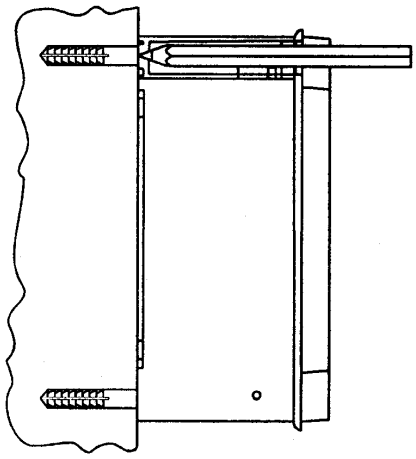

Figure 17. Marking the corner holes on the wall.

9. Drill the holes in the wall using an appropriate drill that is applicable for the wall.

10. Mount the cabinet to the wall. Use appropriate screws and plugs.

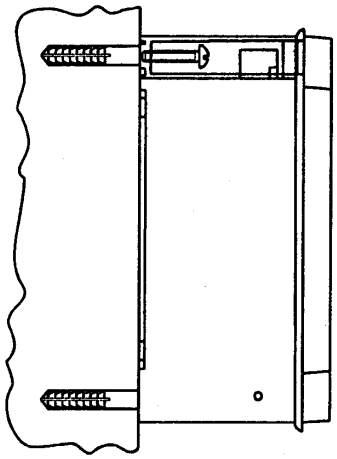

Figure 18. Mounting the cabinet to the wall.

11. Push the special nuts that came with the cabinet into the corner holes of the cabinet.

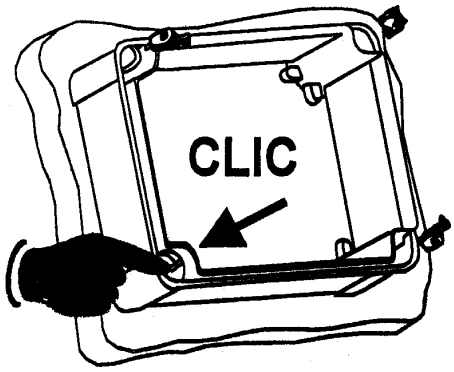

Figure 19. Pushing the special nuts in place in the corners of the cabinet.

12. Lead the cable via the swivel into the cabinet. Note: the cable length in the cabinet must be 20 cm (this includes the RJ45 connector which you have to mount to the cable later on).

    Note: *At the outside of the box, the cable must be led directly from the cabinet into the building to avoid exposing the cable to lightning.*

13. Tighten the cable inlet on the swivel and make sure that the cable inlet is waterproof.

14. Mount the RJ45 connector to the cable using the tool for mounting an RJ45 connector plug to a Category 5 cable. For standard colour schemes, consult Chapter 4. WIRE COLOUR CODING FOR CATEGORY 5 CABLES.

15. Open the AP300E box by means of removing the two screws at the rear side of the AP300E.

16. Use a small pair of tongs to open the predefined holes in the AP300 cabinet.

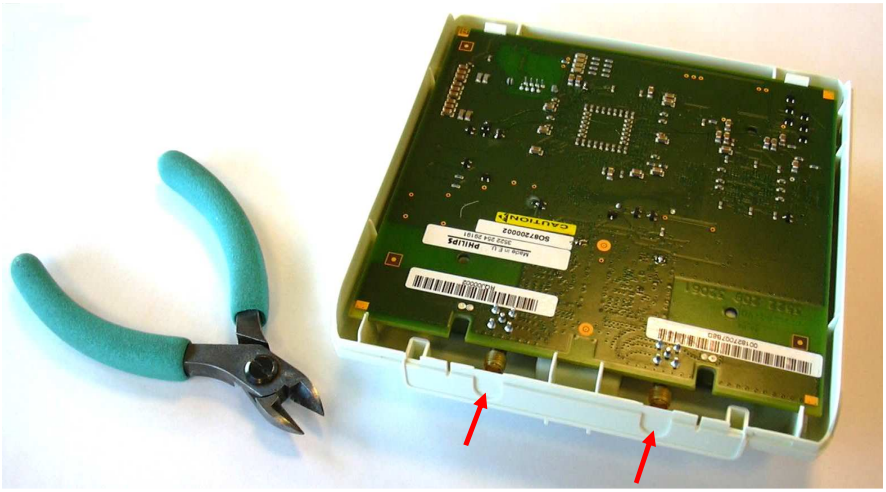

Figure 20. AP300 cabinet and pair of tongs.

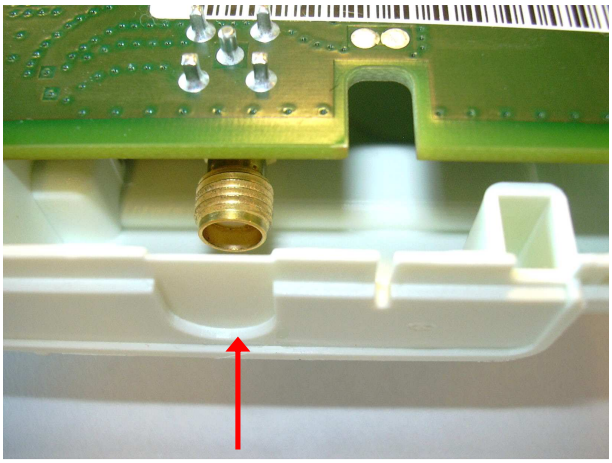

Figure 21. Detail of the AP300 of predefined hole in the AP300 cabinet.

17. Connect the RJ45 ethernet plug to the AP300E and mount the antenna cables to it. Also connect the other end of the cables to the Directional antenna.

    Note: *Use the SMA Torque Wrench to fasten the coax nuts on the AP300E. Otherwise you can easily damage the screw-thread.*

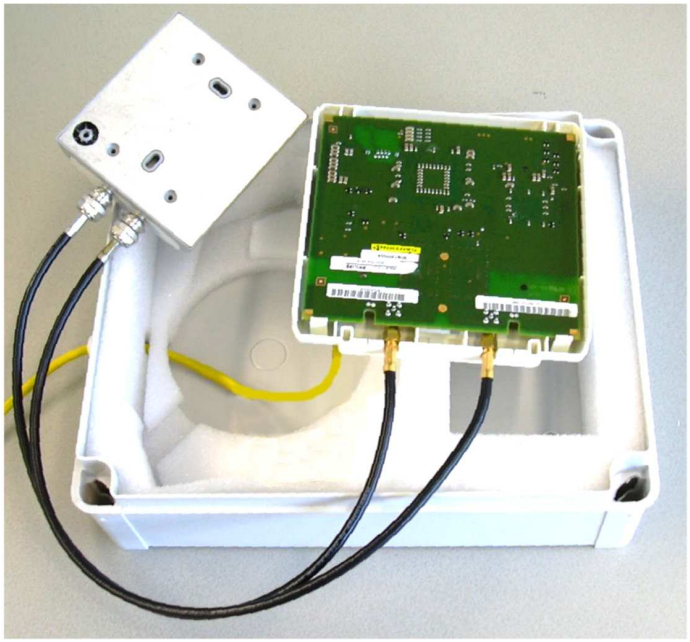

Figure 22. Connecting the cables to the AP300E

18. Close the AP300E box and mount the two screws at the rear side of the AP300E box.

19. Connect the RJ45 connector to the AP300 (at the rear side).

20. Push the AP300E into its position in the foam.

21. Lead the coax antenna cables via the top side of the foam and determine the position of the directional antenna. Note that the hole in the foam is not big enough for the antenna. This is done on purpose, in order to allow various positions of the direction antenna.

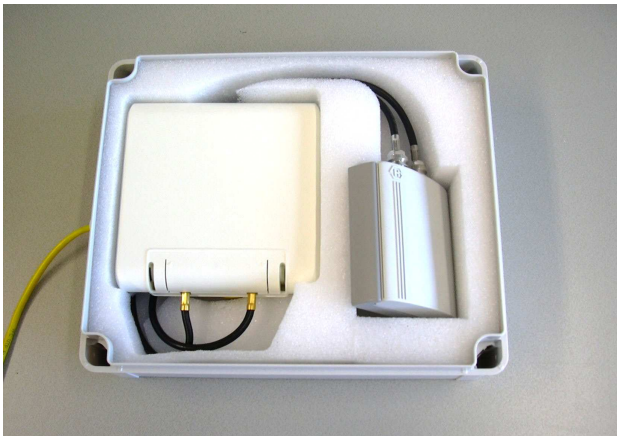

Figure 23. Antenna does not fit into the hole.

22. Cut the hole for the directional antenna to the correct size, to be able to push the antenna in the hole.

Figure 24. Cutting the foam to allow the antenna to fit into it, in the required position.

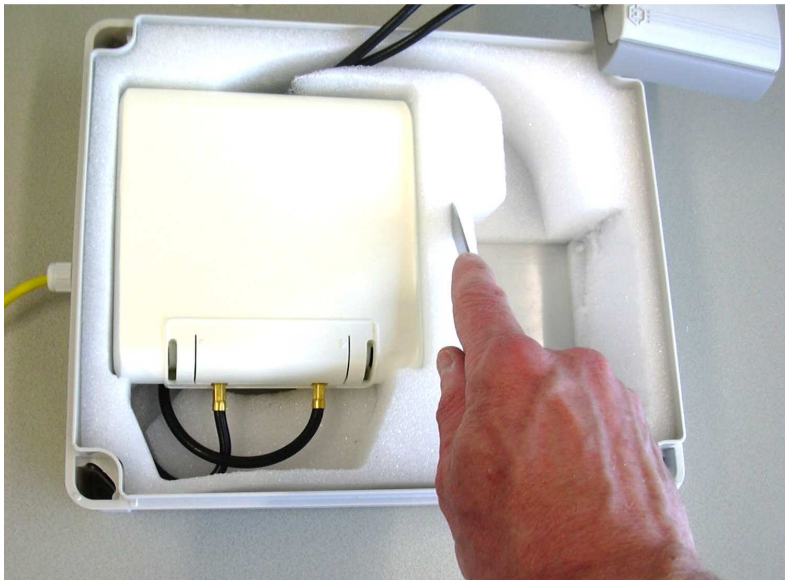

Figure 25. Cutting the foam to allow the antenna to fit into it, in the required position.

23. Lead the coax cables to the antenna via the groove in the top of the foam and push the antenna into its final position into the foam.

Note: *You can change the position of the antenna to the required position in the foam, by means of turning the antenna or giving it some tilt.*

Figure 26. AP300 and directional antenna in their positions.

24. Mount the cover of the cabinet onto the cabinet with the four plastic screws in each corner of the cover. The cabinet is now closed.

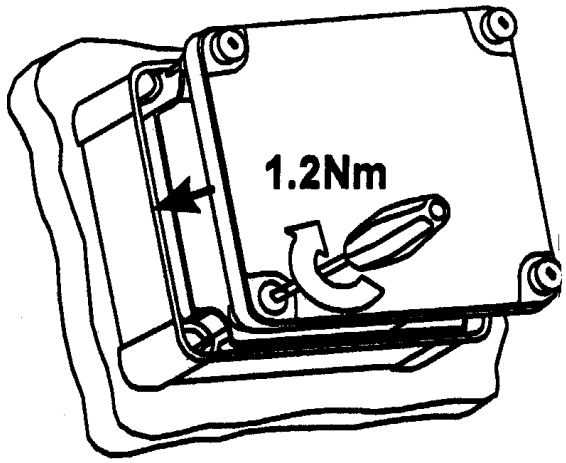

Figure 27. Mounting the cover.

4. WIRE COLOUR CODING FOR CATEGORY 5 CABLES

This chapter shows you the normal colour coding for category 5 cables (4 pair) based on the two standards supported by TIA/EIA: the 568A and 568B standard. These standards apply to the colour code used with a ***single*** cable run: BOTH ENDS MUST USE THE SAME STANDARD. Which standard to use, is a matter of local decision. However, since they both use the same pin out at the connectors you can mix 568A and 568B cables in any installation.

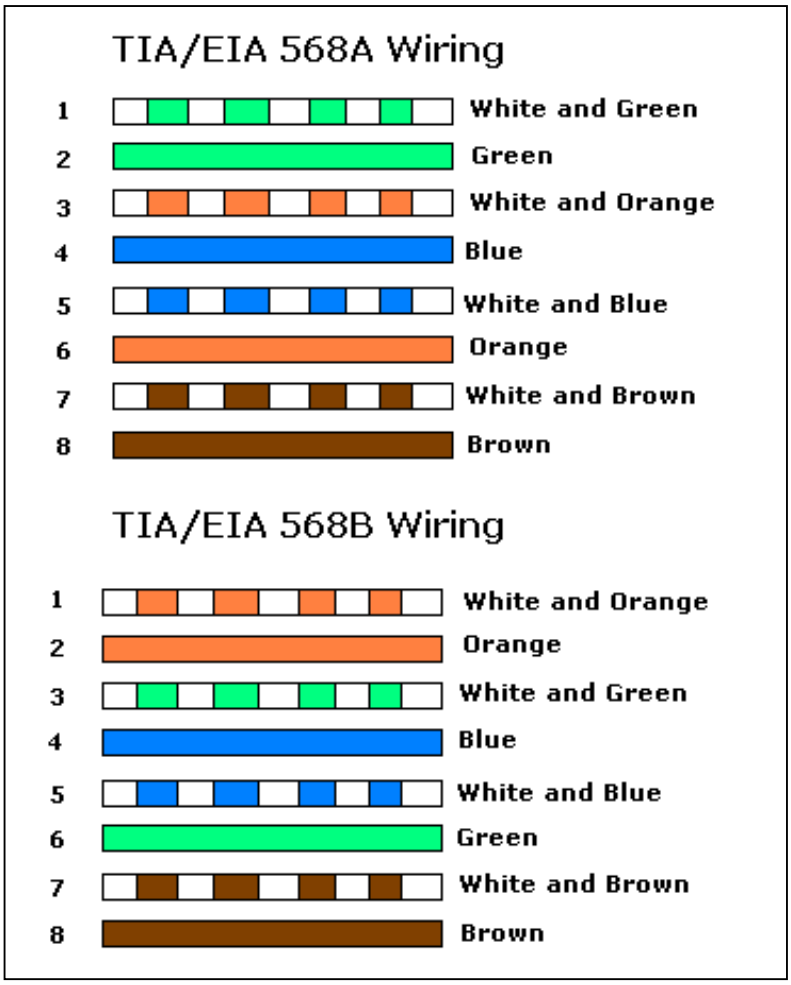

Figure 28 Colour Schemes for Wires in Category 5 Ethernet Cabling.

5. SPECIFICATIONS

Dimensions (W x H x D)..... : 275 x 225 x 80

Outside temperature range ..... : -20° C . . . 45° C

IP Specification ..... : IP66