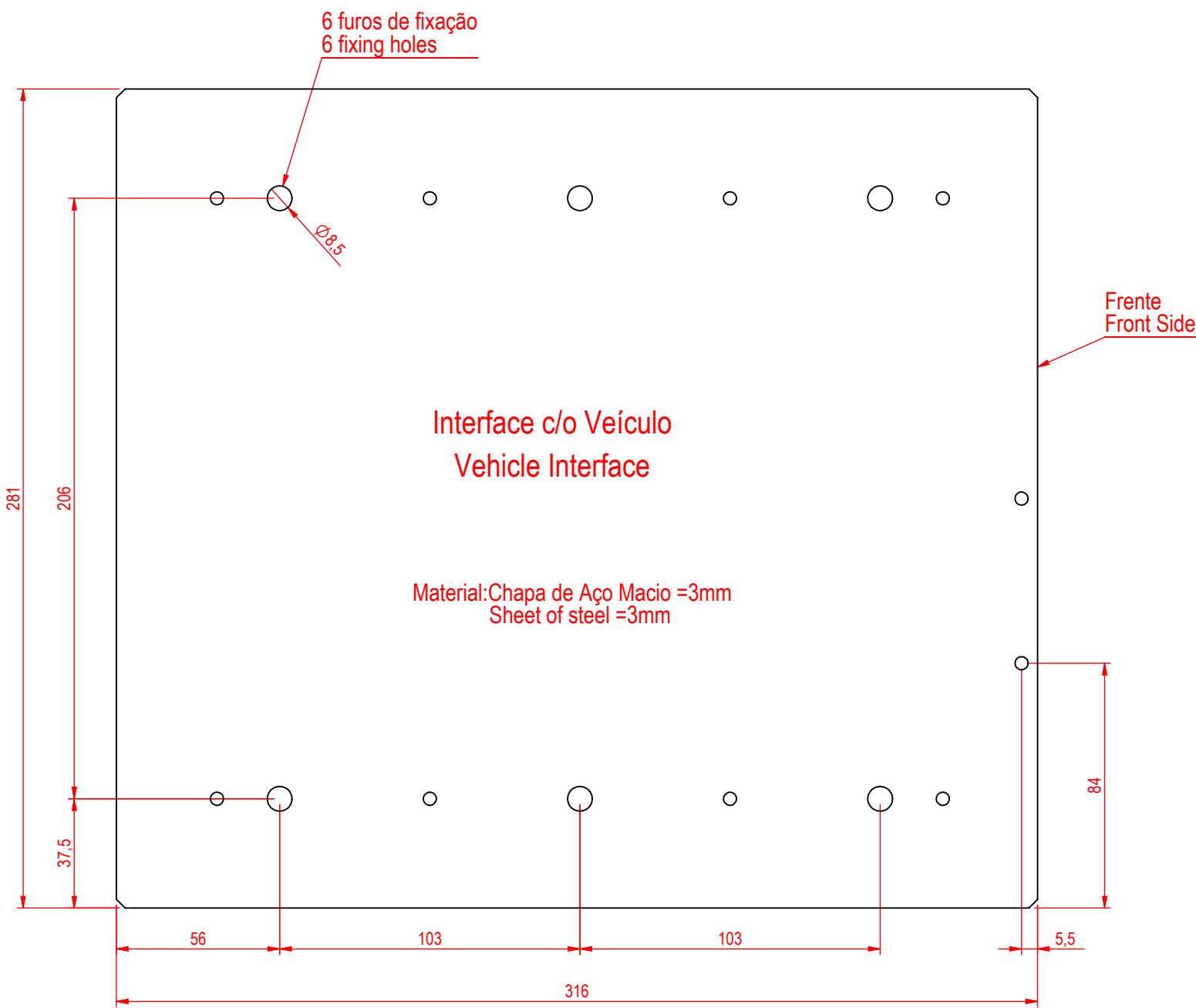
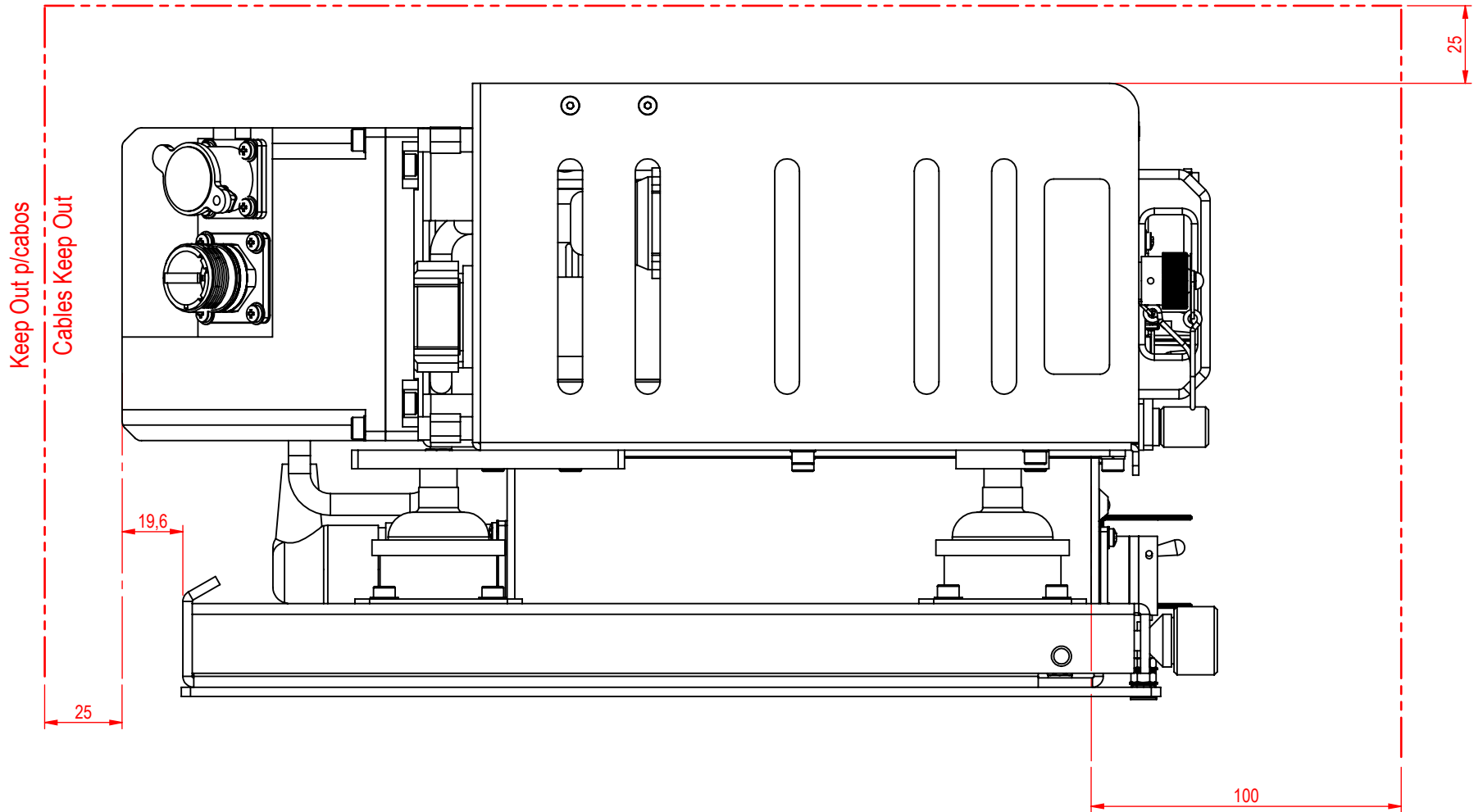




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MOD-UN-03-06



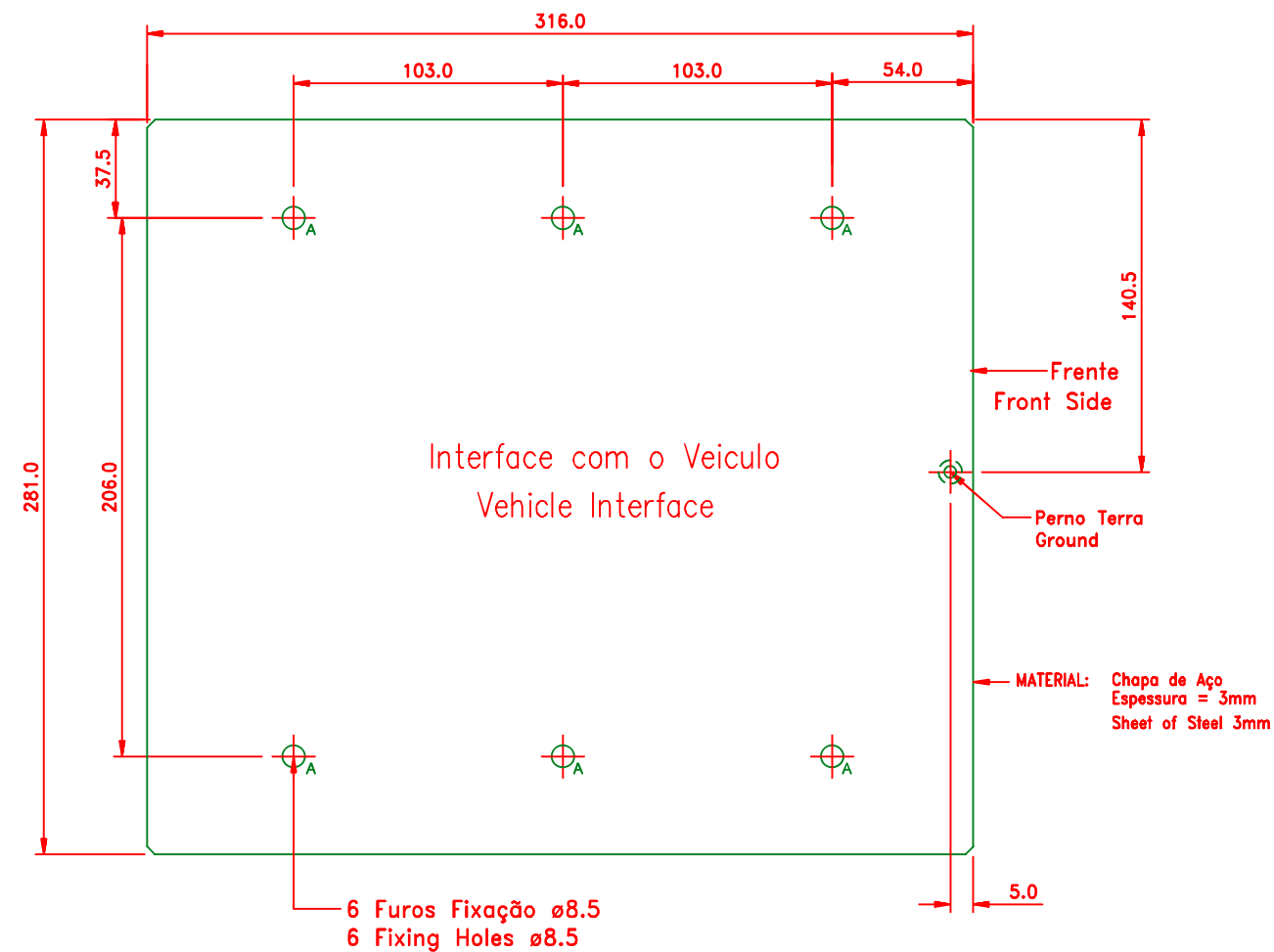
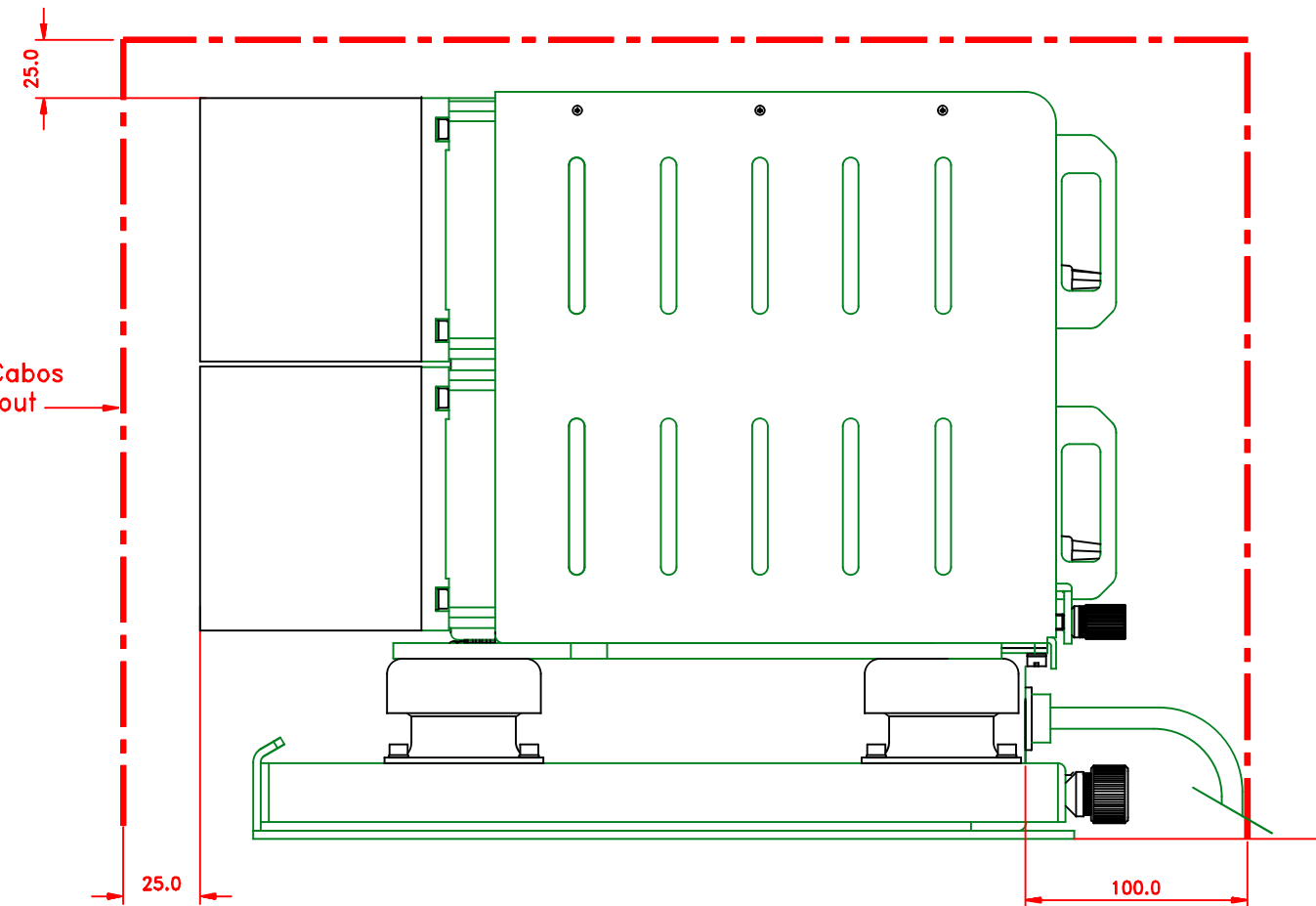
							
1	2014-07-17			GAP	JGC		DSV
ED. Rev.	DATA Date	NOTAS DE EDIÇÃO Revision Notes		EXEC. Drawn	VERIF. Check.		APROV. Approv.
CAD		TOL:	Outline Drawing Mont.Veic.Simples (c/PA 50W)				COD:
F:						5810/40450000DA	
		ESC: Scale: 1:2				FL: Sh: 1 / 1	


Salvo indicação em contrário, todas as cotas estão em milímetros  
*Unless otherwise specified, all dimensions are in millimeters*

ORIG-A

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MOD-UN-03-06



3	2009-03-09							GAP		DSV
ED. Rev.	DATA Date	NOTAS DE EDIÇÃO <i>Revision Notes</i>						EXEC. Drawn	VERIF. Check.	APROV. Approv.
CAD	TOL:		Outline Drawing Montagem Veicular Dupla (Com PA 50W)							
F:										
	ESC: Scale:									



COD:	5810/40460000DA
FL:	1/1
Sh:	

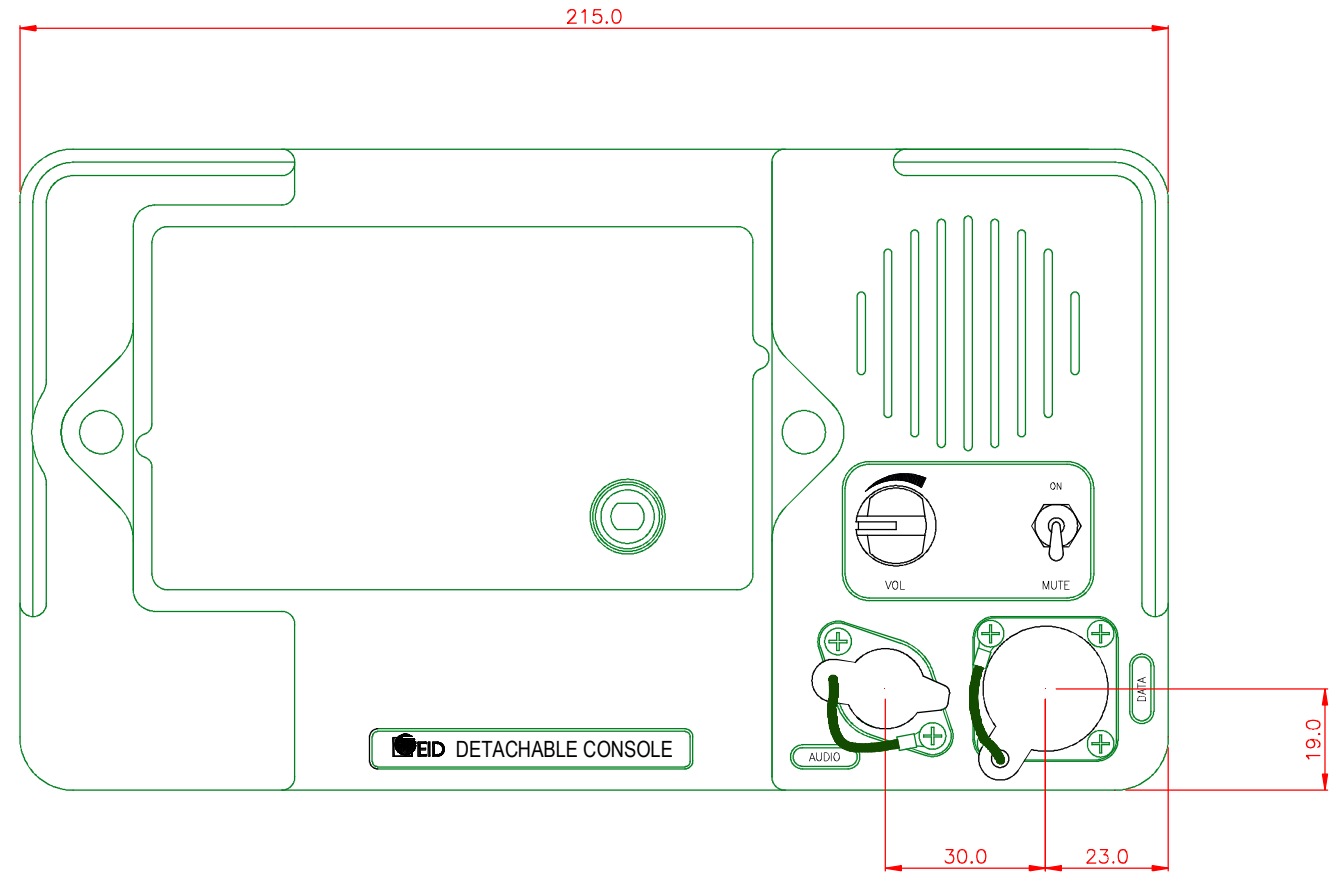
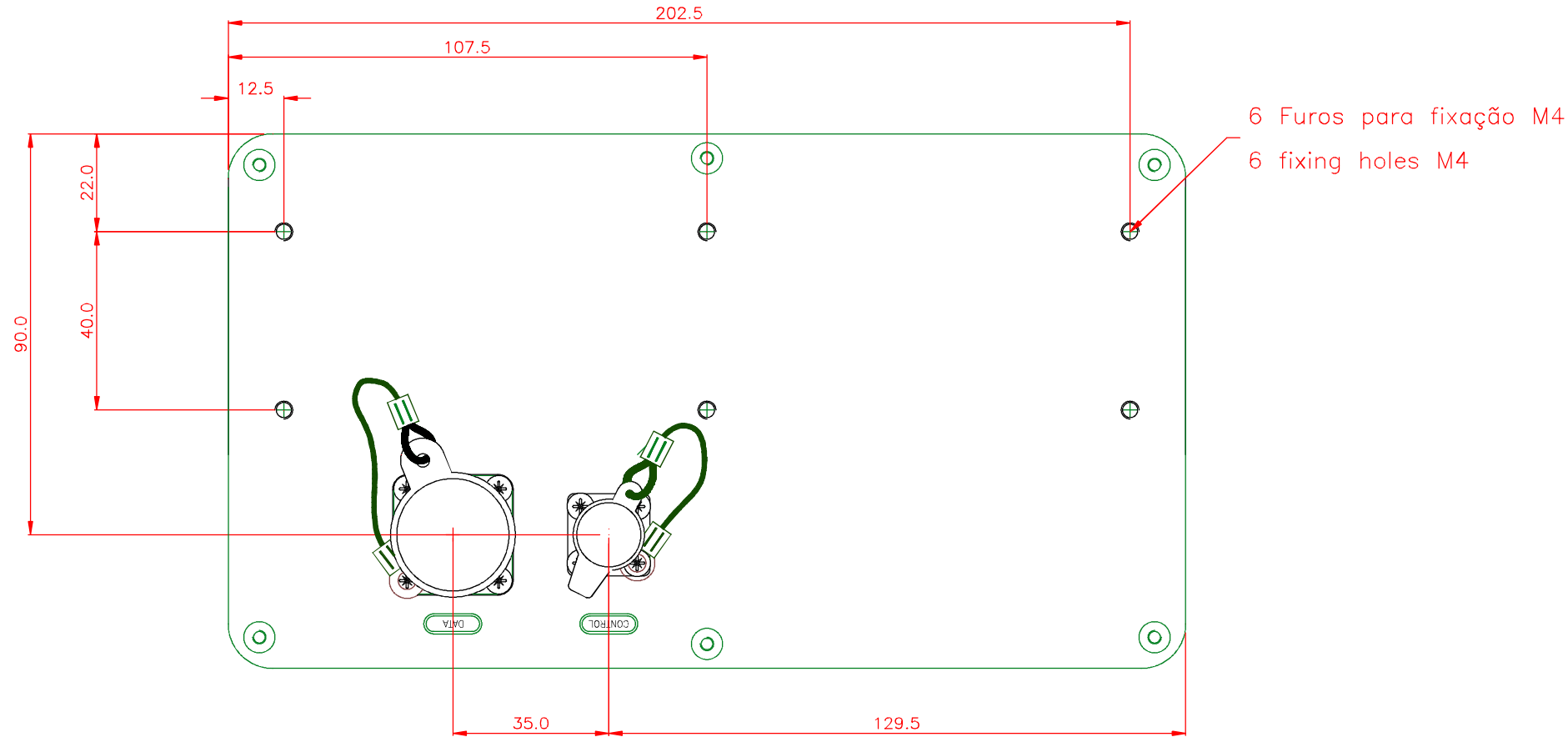
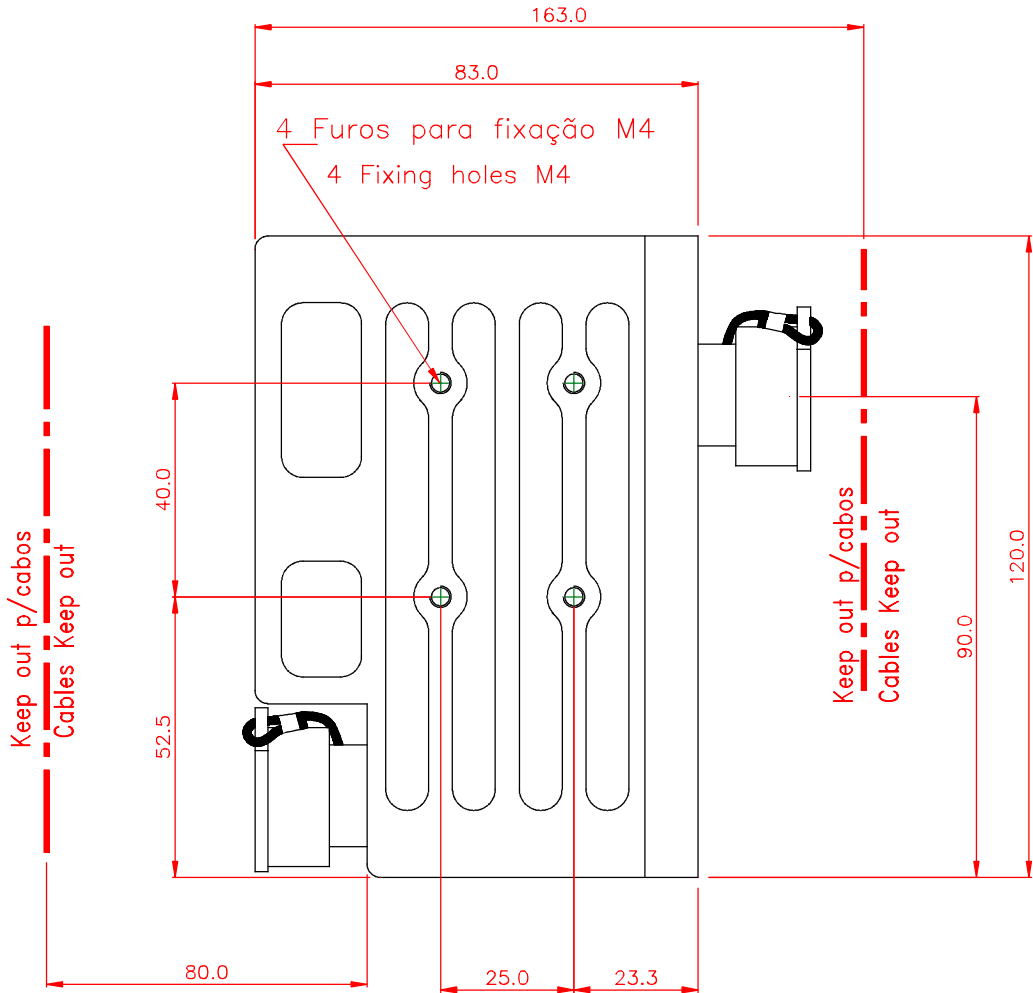
Salvo indicação em contrário, todas as cotas estão em milímetros  
*Unless otherwise specified, all dimensions are in millimeters*

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MOD-UN-03-06



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Unless otherwise specified, all dimensions are in millimeters

3	2010-06-08	0A2010154	GAP	JBC	JGC		COD: 5810/40290000DA
2	2003-11-07		RAF				
1	2002-03-14		RAF				
ED. Rev.	DATA Date	NOTAS DE EDIÇÃO Revision Notes	EXEC. Drawn	VERIF. Check.	APROV. Approv.	FL: 1/1	
CAD	TOL:	OUTLINE DRAWING CDS-525 - CONSOLA DEST. SIMPLS					
F:	ESC: Scale:						
							

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MOD-UN-03-0



Salvo indicação em contrário, todas as cotas estão em milímetros  
Unless otherwise specified, all dimensions are in millimeters

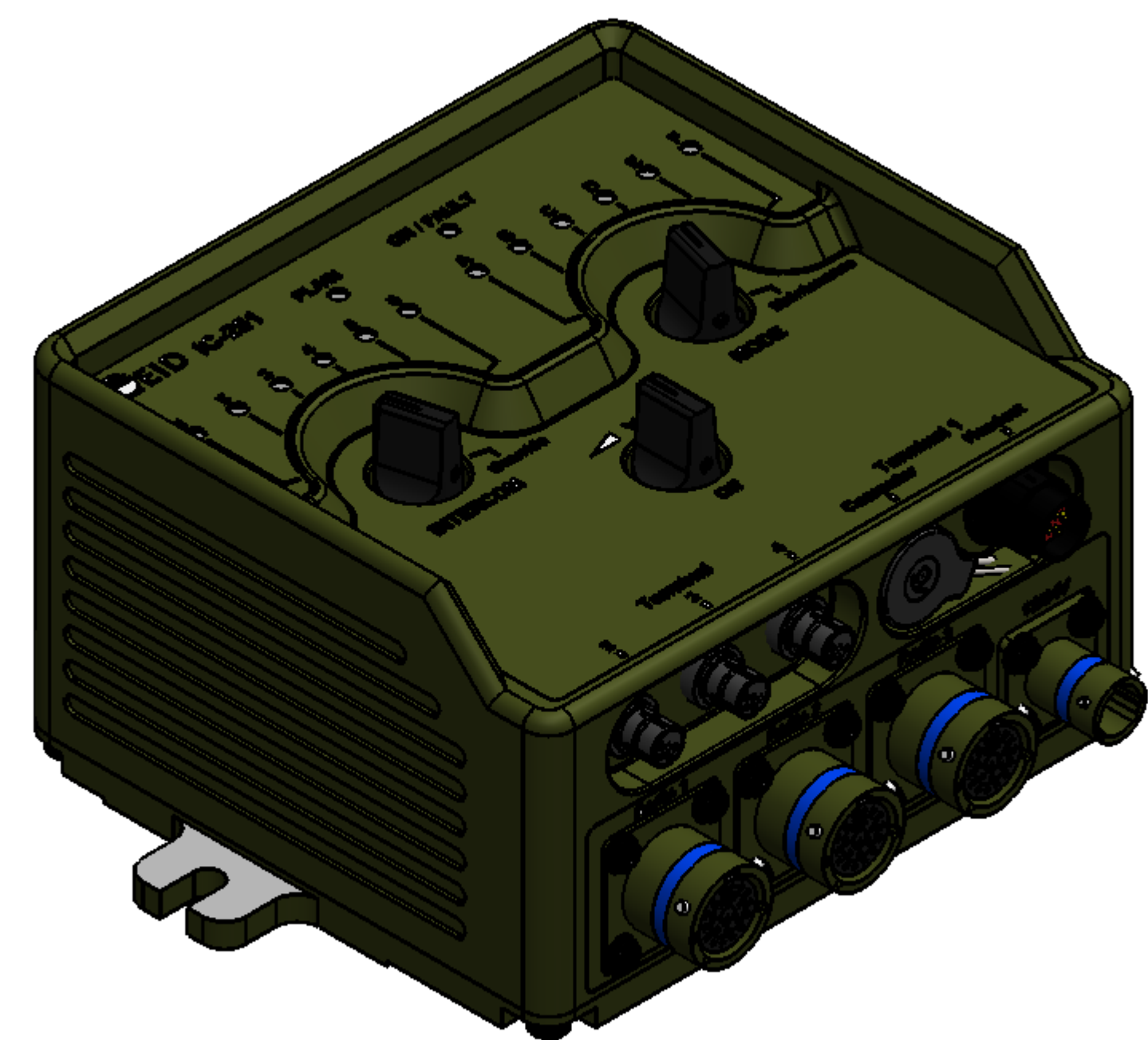
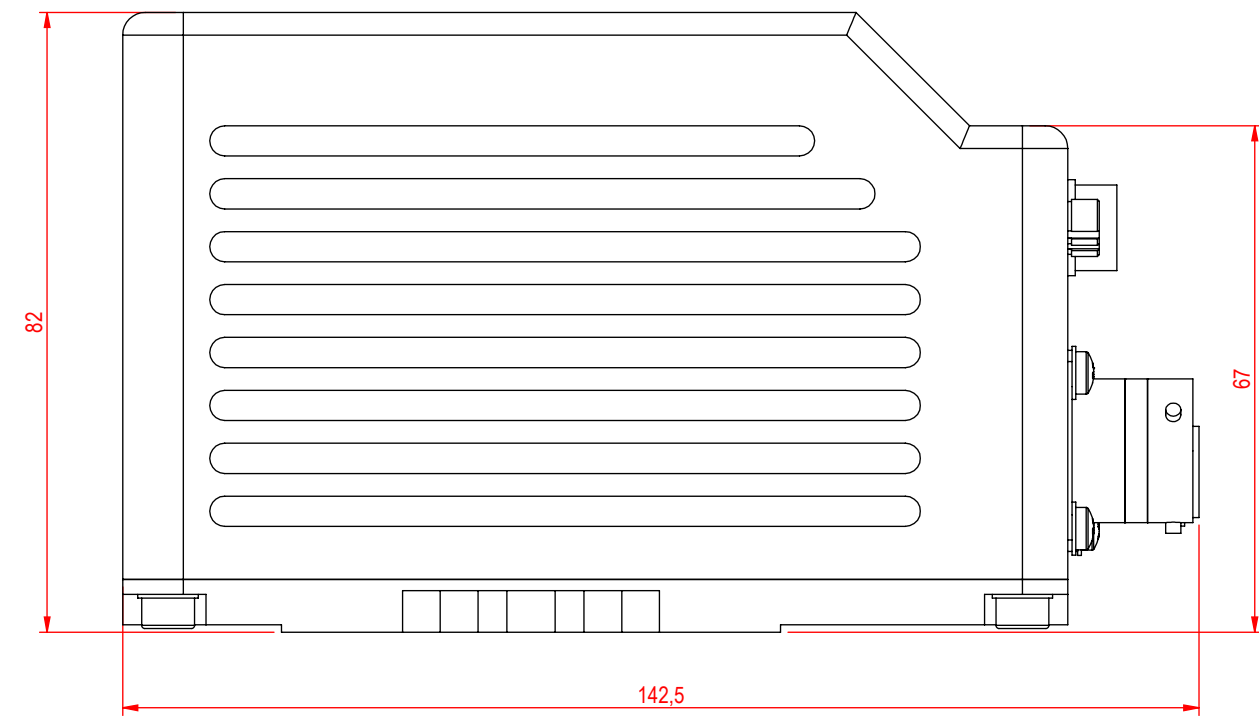
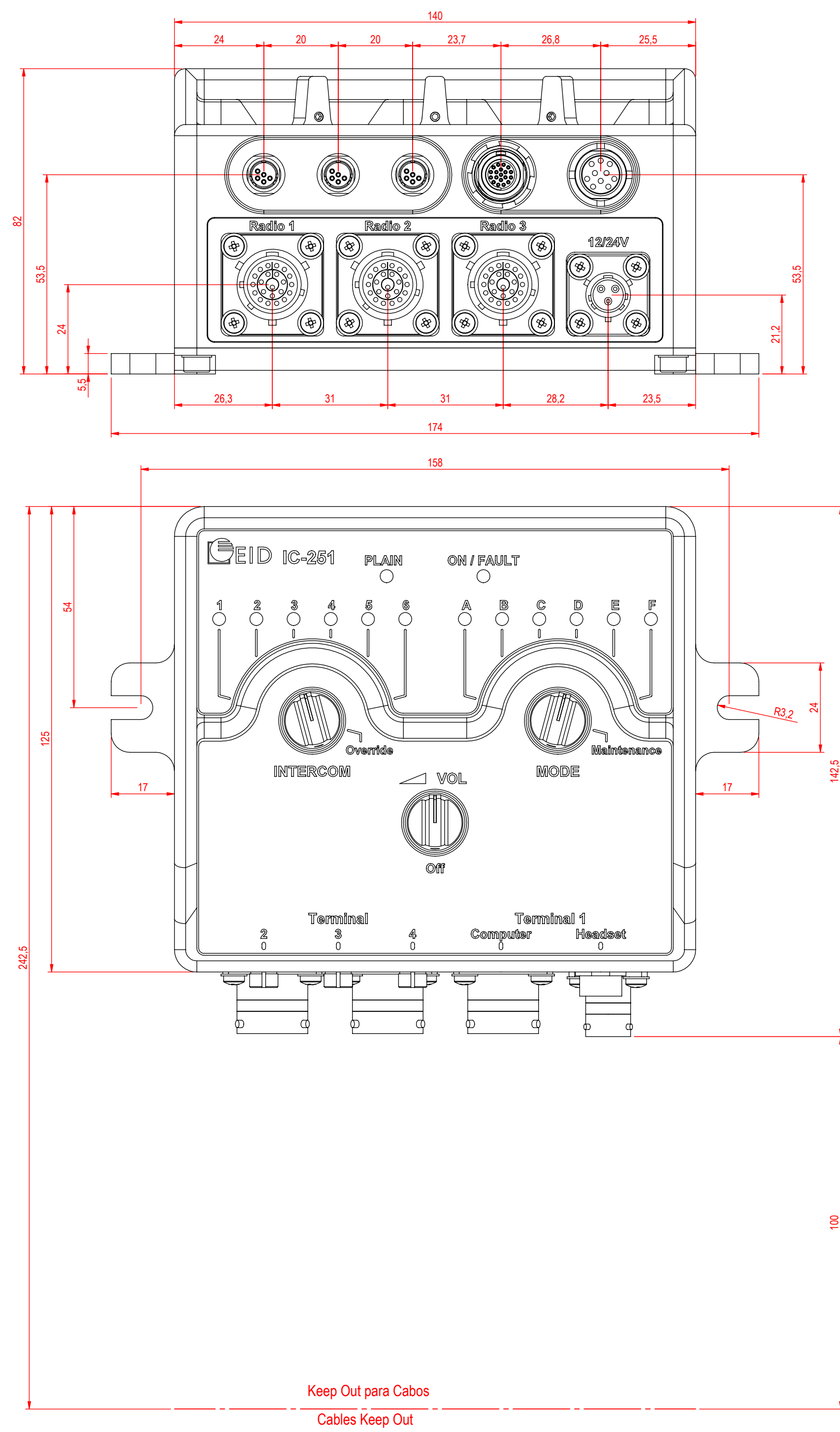


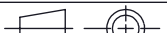
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MOD-UN-03-06



3	2012-12-19	OA2012199	JMC	JBC	JGC	
2	2012-05-08	OA2012070	JMC	JBC	JGC	
4	2014-06-12	OA2014089	JMC	JBC	FMP	
ED. Rev.	DATA Date	NOTAS DE EDIÇÃO Revision Notes	EXEC. Drawn	VERIF. Check.	APROV. Approv.	
CAD	TOL: DIN 7168 G.M.		IC-251 Compact Central Unit Outline Drawing			COD:  5820/40300000DA
F:	ESC: Scale: 1:1					
			FL: Sh: 1 / 1			



Salvo indicação em contrário, todas as cotas estão em milímetros  
Unless otherwise specified, all dimensions are in millimeters

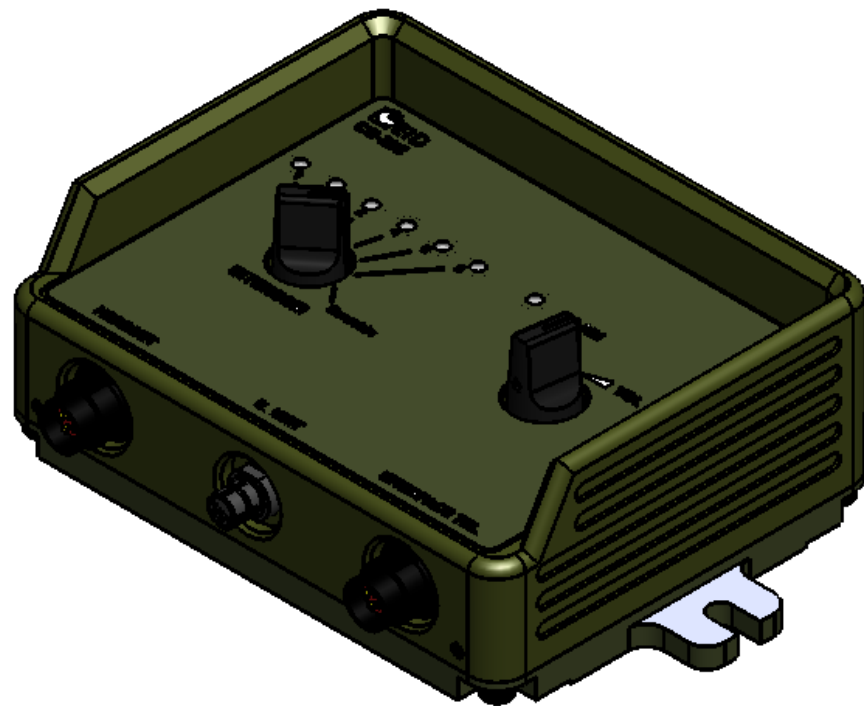
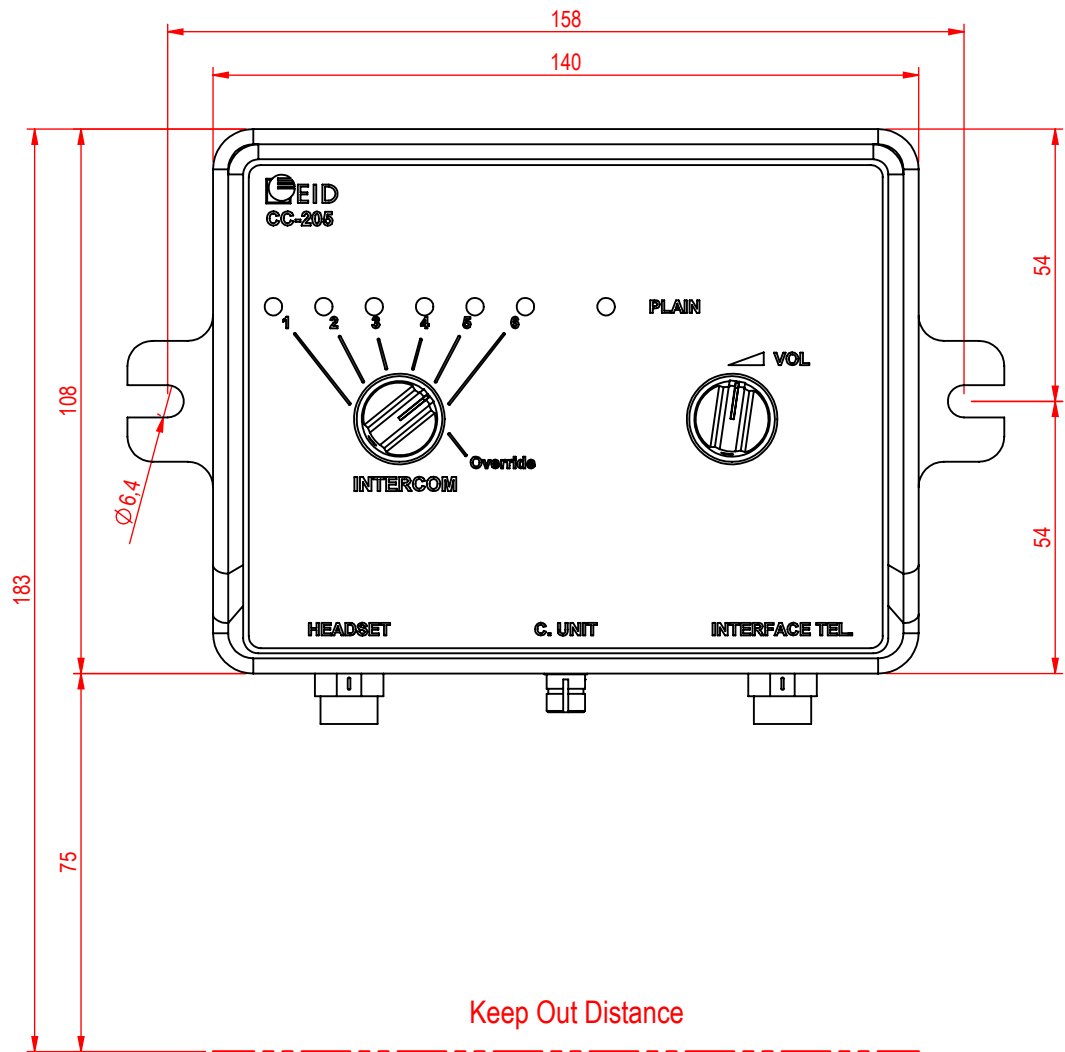
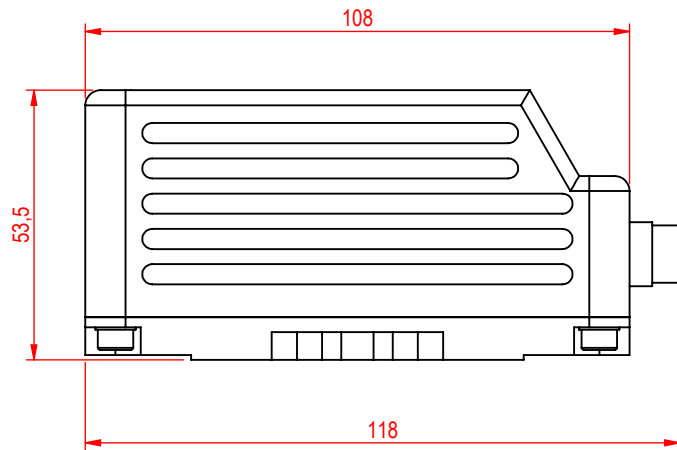
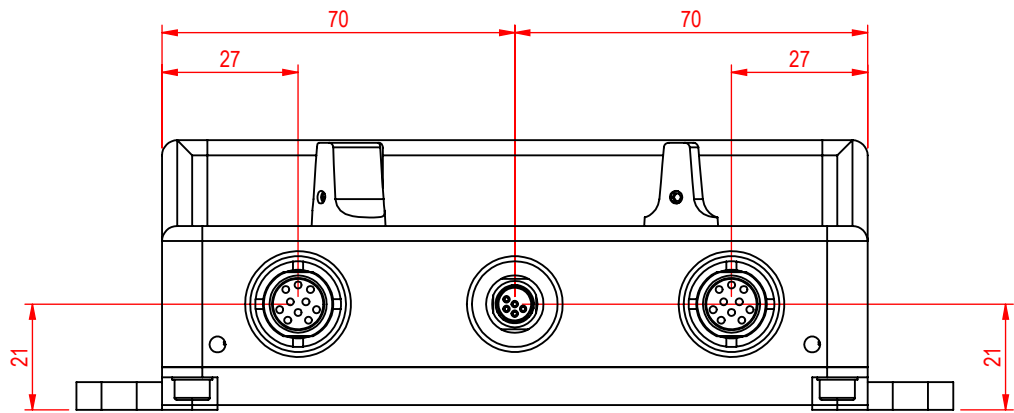
ORIG:A2

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MOD-UN-03-07



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Unless otherwise specified, all dimensions are in millimeters

2	2014-05-26	OA2014076	JMC	JBC	DSV	
1	2010-11-08		JMC	JBC	JST	
ED. Rev.	DATA Date	NOTAS DE EDIÇÃO Revision Notes	EXEC. Drawn	VERIF. Check.	APROV. Approv.	
CAD		TOL: DIN 7168 G.M.	CC-201 Crew Terminal Unit Outline Drawing			COD: 5820/40180000DA
F:		ESC: Scale: 1:1.5				FL: Sh: 1 / 1

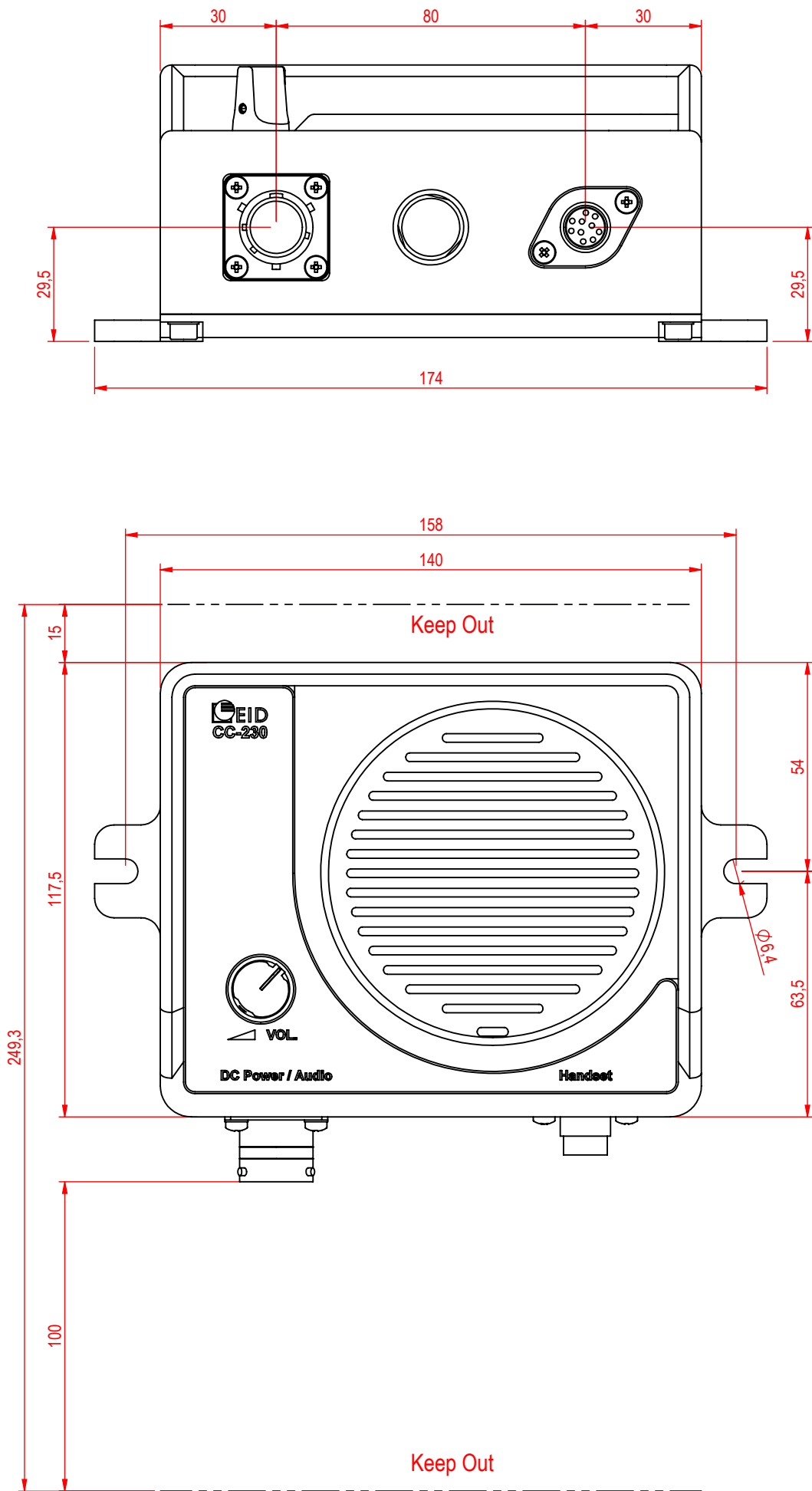
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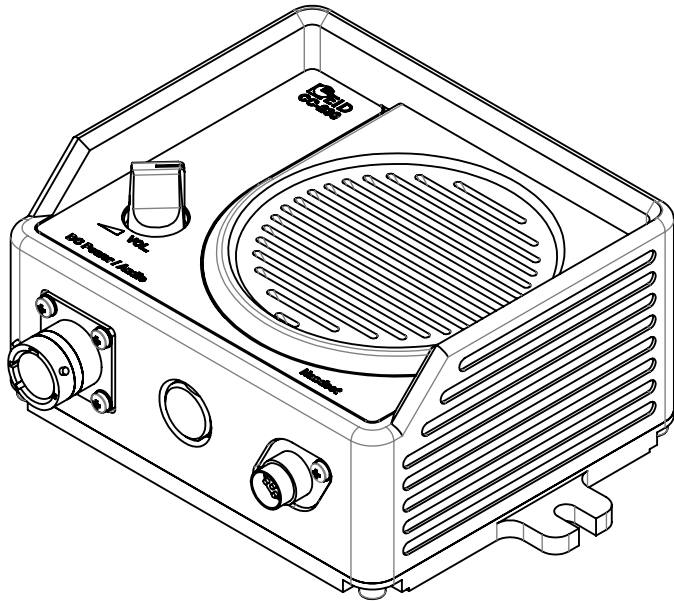
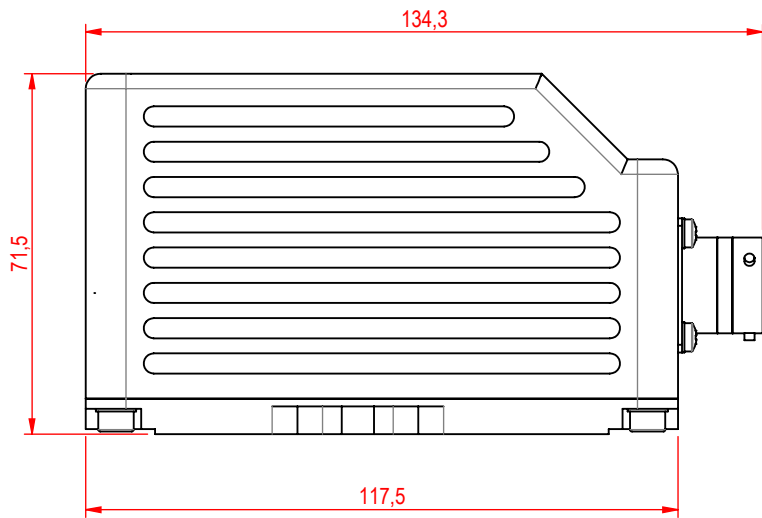
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MOD-UN-03-07



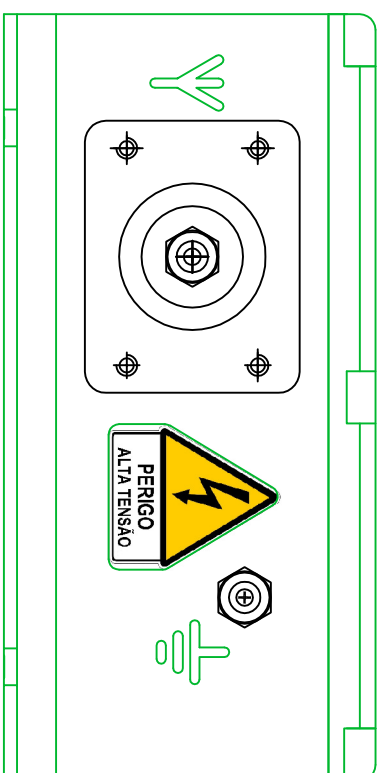
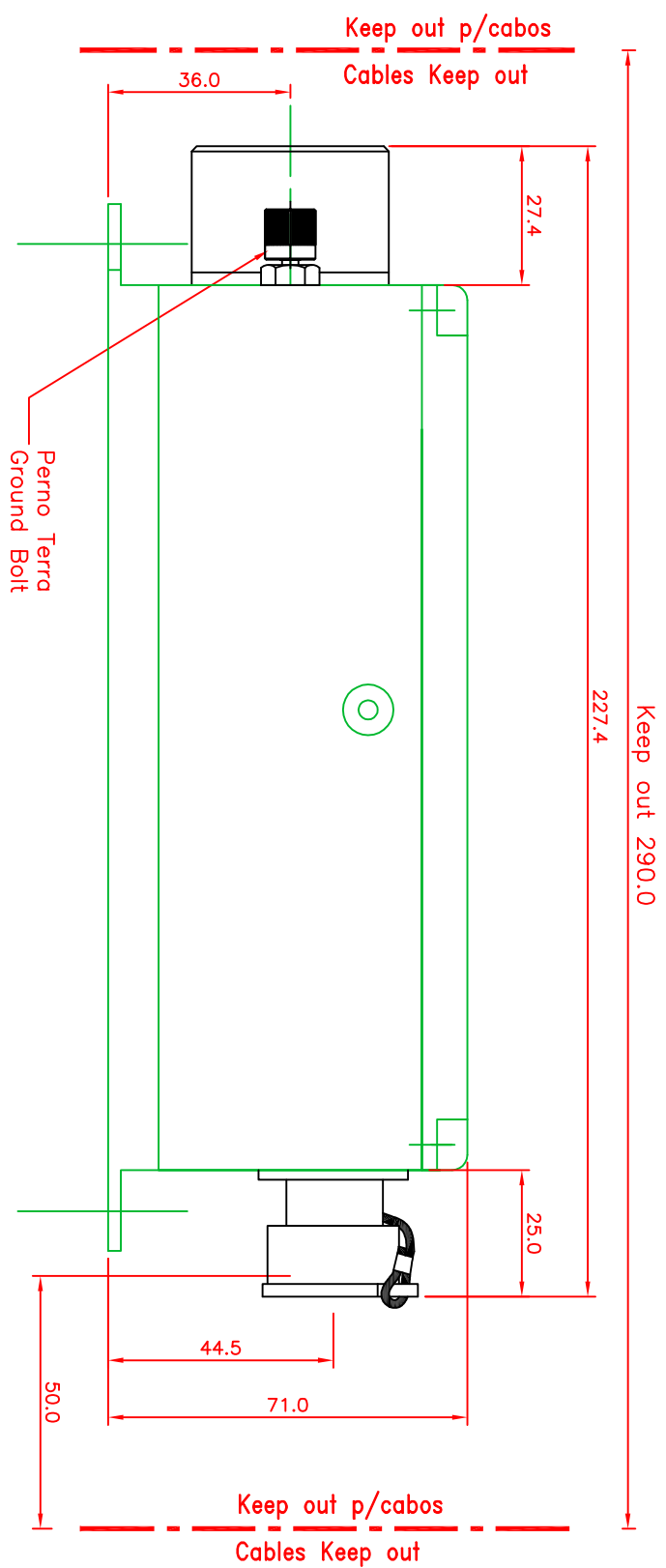
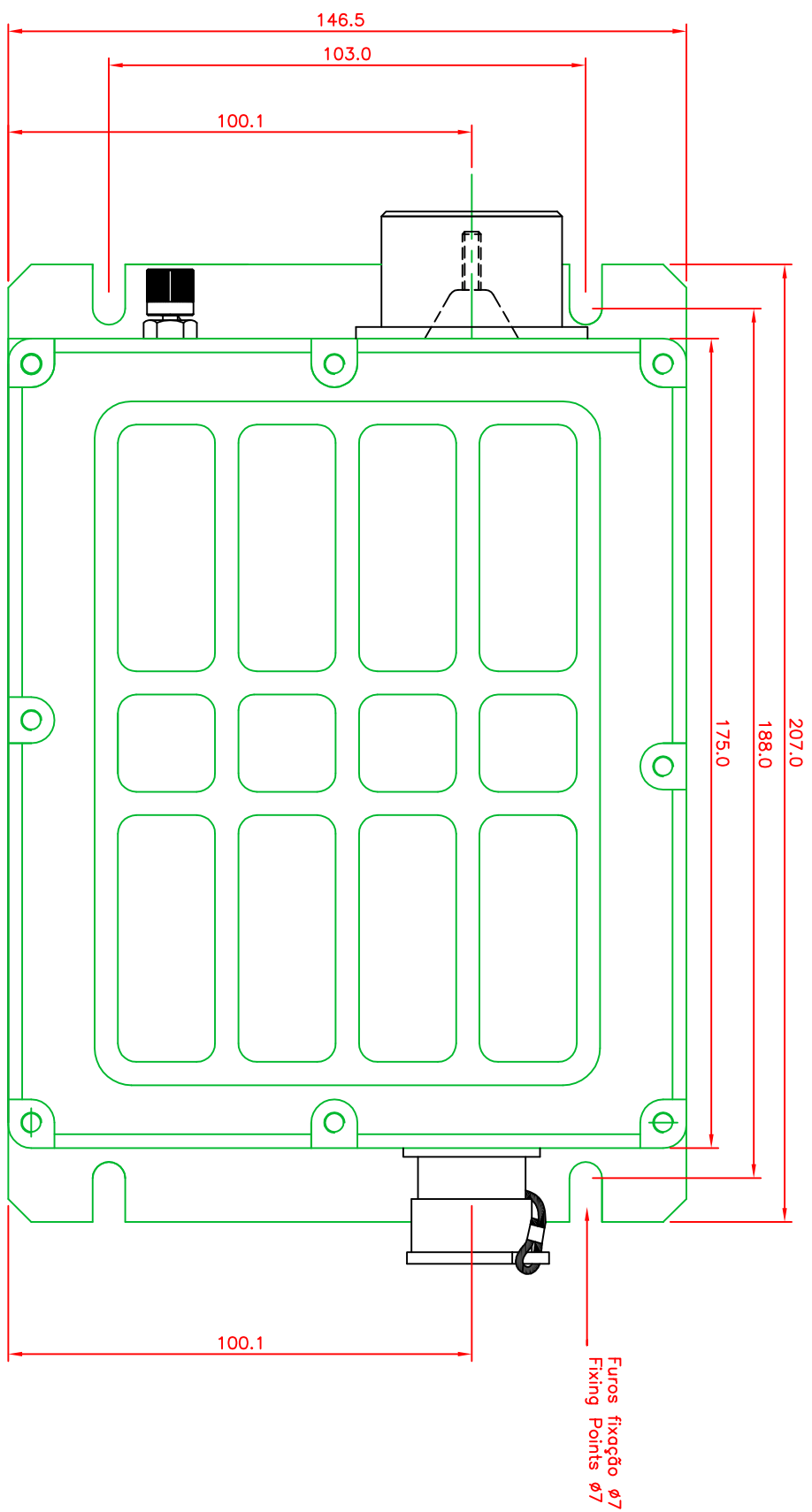
Salvo indicação em contrário, todas as cotas estão em milímetros  
Unless otherwise specified, all dimensions are in millimeters





1	2010-08-27		JMC	JBC	JGC		
ED. Rev.	DATA Date	NOTAS DE EDIÇÃO Revision Notes	EXEC. Drawn	VERIF. Check.	APROV. Approv.		
CAD		TOL:	CC-230 Terminal Altifalante Outline Drawing			COD:	4202/40040000DA
F:						FL: Sh:	1 / 1
		ESC: Scale: 1:1.5					



ORIG:A3



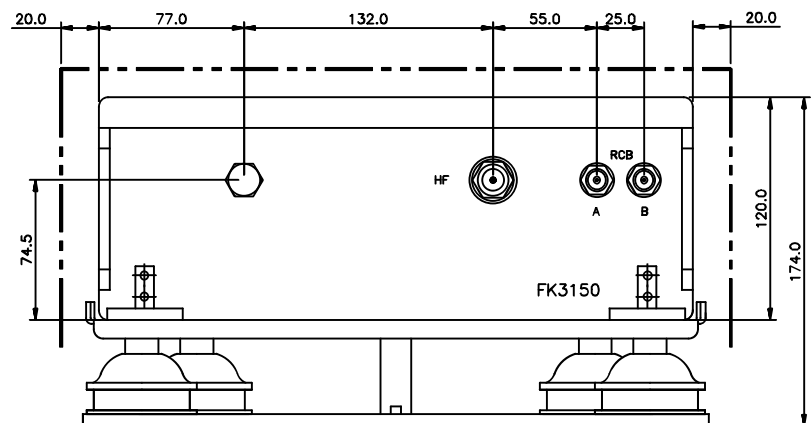
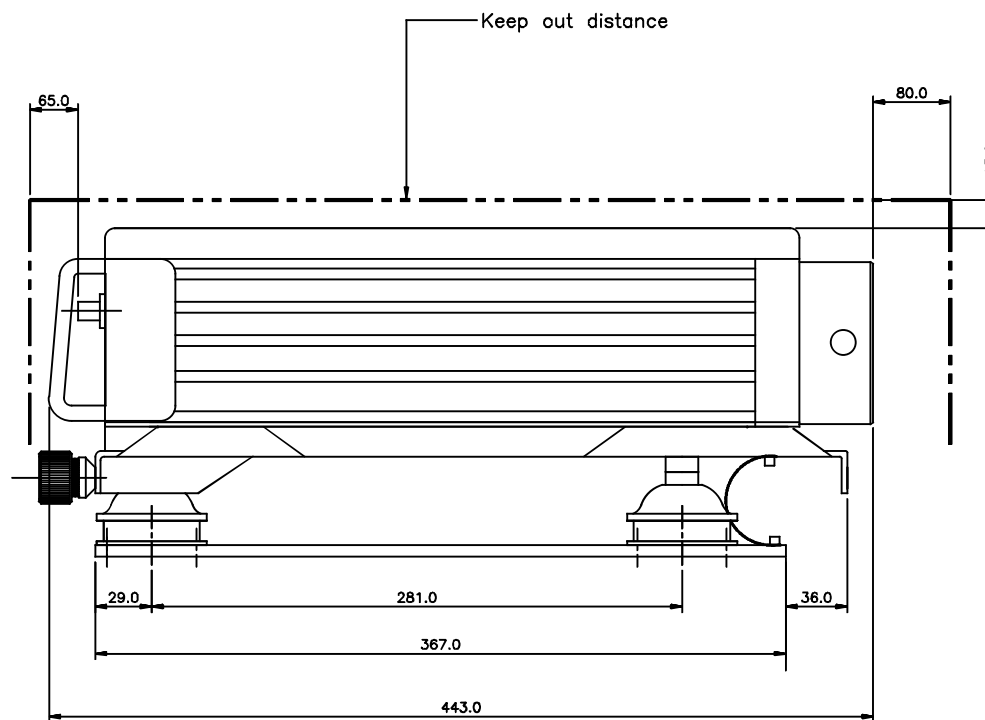
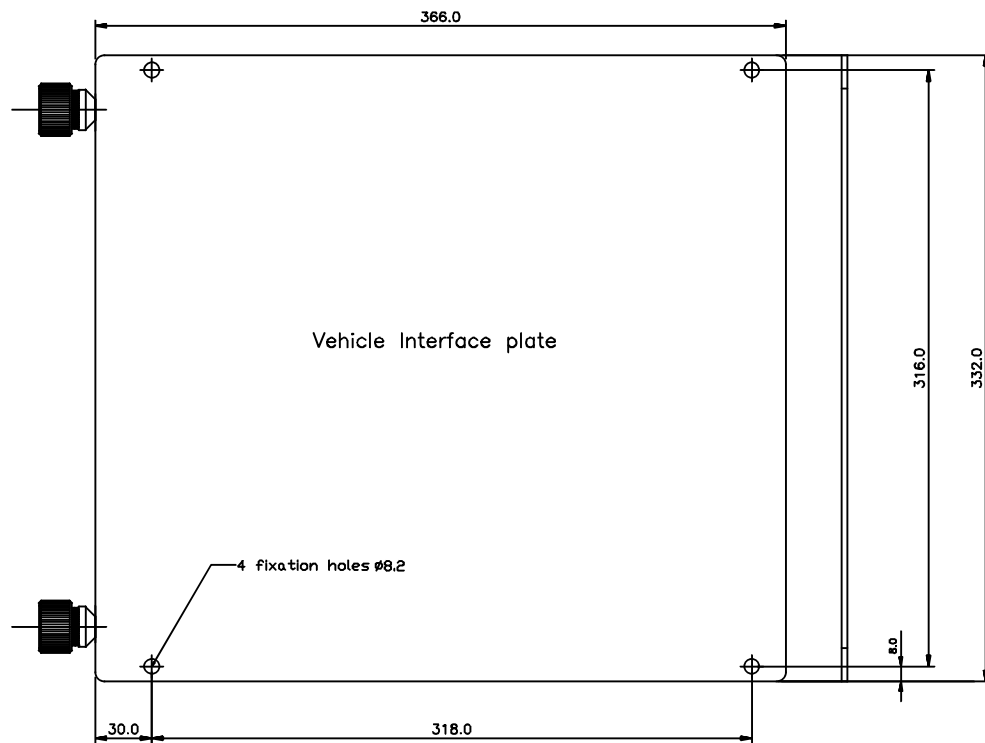
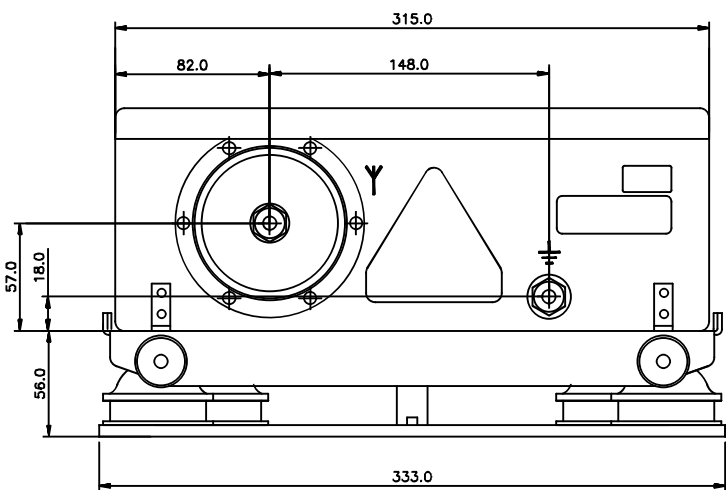
									
COD: 5893/40230000DA									
F1: 1/1									
Sd:									
Outline Drawing ATU 20W									
TOL:									
CAD									
F:									
ESC: Scale:									
									
1 2009-03-05									
E.O. DATA									
Rev. Date									
NOTAS DE EDIÇÃO									
Revision Notes									
GAP									
EXEC. DRAWN									
JBC									
VERIF. CHECK									
JGC									
APROV. APPROV.									



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1	2005-06-15																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		</
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# Hughes 9250 BGAN Mobile Satellite Terminal

**HUGHES**



Broadband satellite  
IP terminal and  
WLAN access point

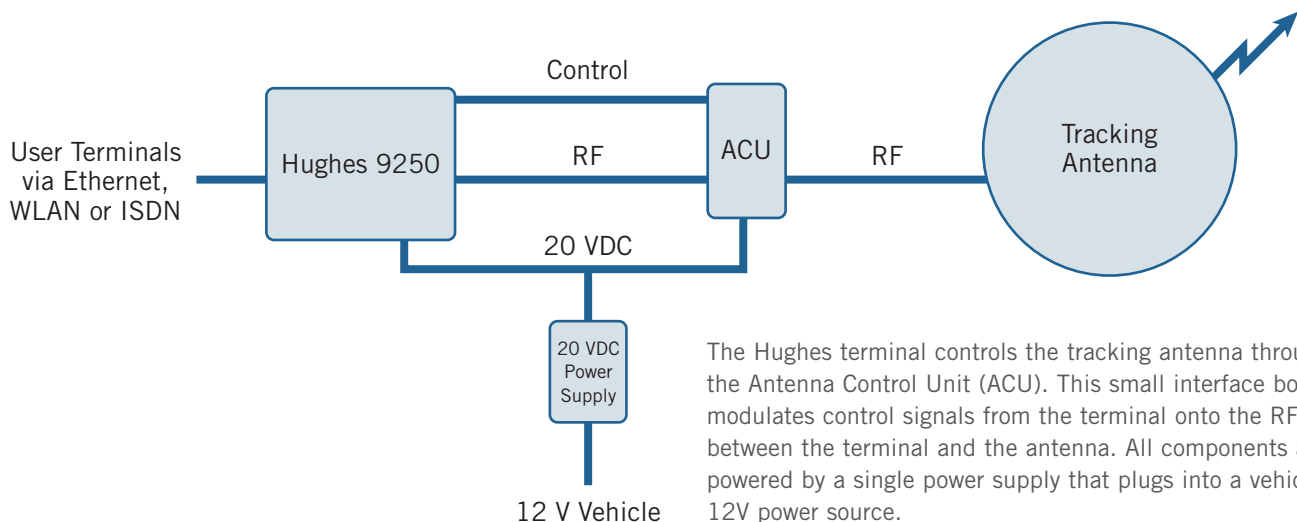
**inmarsat**

Imagine connecting at IP broadband rates of up to 492 kbps (depending on look angle) transmit and receive while on the move—with a complete mobile communications package that includes an IP broadband satellite IP modem and tracking antenna. That's exactly what comes with the breakthrough Hughes 9250 mobile satellite terminal. Fully approved for operation on Inmarsat's global\* BGAN satellite service, it means high-performance connectivity on the move for the most demanding environments.

Ideal for emergency responders, reporters, and mobile workers who need reliable, high-speed connectivity on the move.

Collaborate with staff back at headquarters using video, voice, and data simultaneously. Create a wireless hotspot for team members on the scene using the built-in WiFi Access Point. The Hughes 9250 is IP compatible and offers selectable, dedicated Quality of Service levels. And it's easy to install on any vehicle—the compact tracking antenna is packaged with a magnetic roof mount and a single cable connection.

The Hughes 9250 allows you to send and receive IP packet data via Ethernet and WLAN interfaces in a land-vehicular application. In parallel with the packet data services, the same terminal supports a circuit switched voice call or a 64 kbps ISDN data call.



The Hughes terminal controls the tracking antenna through the Antenna Control Unit (ACU). This small interface box modulates control signals from the terminal onto the RF link between the terminal and the antenna. All components are powered by a single power supply that plugs into a vehicular 12V power source.

## Features

### Key features:

- Fully autonomous tracking antenna acquires and tracks the BGAN satellite signal while on the move
- Easy antenna installation (magnetic mount) on vehicle roof
- Includes antenna control unit and all cables and power supplies for vehicular installation
- Up to 492 kbps shared data rate and 256 kbps streaming IP data rate\*\*
- Auto context activation feature allows PDP contexts to be activated without user action
- Internal web MMI for configuration and control without the use of LaunchPad
- Web MMI is accessible via Wi-Fi enabled PDAs, Blackberrys, and iPhones

### Additional features:

- ISDN bearer capabilities: speech (4 kbps), 3.1k audio (64 kbps), ISDN data (64 kbps)
- Allows simultaneous use of all interfaces (Ethernet, ISDN, and WLAN)
- WLAN access point
- Multi-user capability (up to 11 simultaneous sessions)
- Selectable Quality of Service (32 kbps, 64 kbps, 128 kbps, or 256 kbps (elevation angles >45 degrees))

### Package includes:

- Tracking antenna including interface box, cable set, and magnetic feet for roof mount.
  - Cable from Antenna Control Unit (ACU) box to terminal is 4 feet in length
  - Cable from ACU box to antenna is 14 feet in length*Note: These cable lengths cannot be changed due to the 4dB attenuation required between the terminal and antenna.*
- Hughes 9250 Broadband Satellite IP Terminal and WLAN Access Point
- Vehicular install kit (includes installation hardware)
- Rechargeable lithium ion battery pack
- DC to DC power supply—powers the satellite modem as well as the tracking antenna.
- Ethernet cable
- ISDN cable
- User guide (PDF file on CD)
- Installation CD

## Technical Specifications

### ■ Terminal

Weight:	2.8 Kg (terminal with battery)
Dimensions:	275 mm x 345 mm x 50 mm
Humidity:	95% RH at +40° C
Temperature:	-25° C to +60° C operating -25° C to +60° C storage (w/ battery)
Power:	Idle: 20 W Max: 100 W (when transmitting)

### ■ Antenna

Weight:	5.5 Kg
Dimensions:	Ø477 mm x 153 mm
Humidity:	95% RH at +40° C
Temperature:	-25° C to +55° C operating -25° C to +80° C survival
Wind:	125 mph (200 km/h) Exception for Magnetic Mount: 100 mph (160 km/h)
Water & Dust:	IP-56 standard
Ice:	25 mm non-operational
Vehicle Motions:	Turning Rate: 40°/s Turning acceleration 50°/s <sup>2</sup>



\*Global coverage is dependent upon the successful operational readiness of additional Inmarsat satellite equipment. Hughes assumes no responsibility for completeness of global coverage.

\*\*Best efforts performance under moving conditions depending on obstruction of satellite signal. Performance is limited by the BGAN system design.

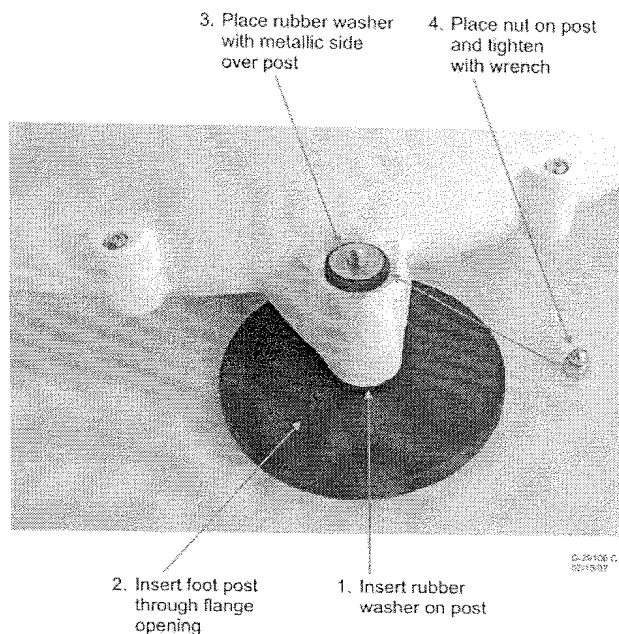
For additional information, please visit our Website at [www.bgan.hughes.com](http://www.bgan.hughes.com).

[www.hughes.com](http://www.hughes.com)

- Hughes 9250 Installation Kit (3500059-0010)
  - Hughes 9250 terminal (3500058-0010)
  - DC/DC power supply (9501495-0001)
  - Serial data cable (3500125-0001)
  - Two Ethernet/ISDN cables for user terminal connections (9501246-0002)
  - Battery (3500065-0001)
  - CD-ROM with LaunchPad MMI software (3500066-0001)
  - DC power extension cable with filter (3500151-0001)
- Vehicular Install Kit (3500158-0001)
  - Vehicular install bracket (3500156-0001)
  - Accessory mounting plate (3500155-0001)
  - Mounting hardware

## Step B: Installing the magnetic mount feet

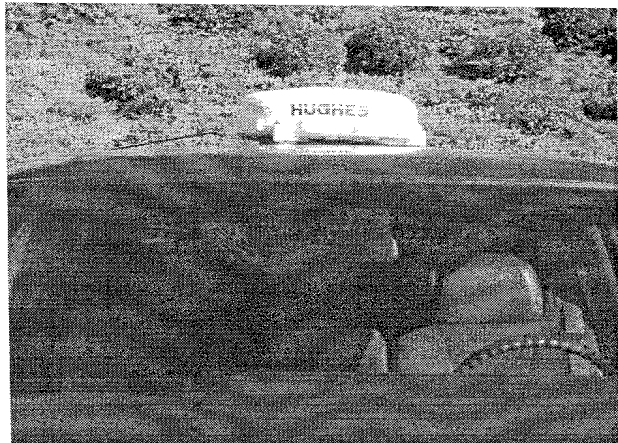
Assemble the three magnetic feet and secure them to the antenna using an 8 mm nut and wrench as shown here.



## Step C: Positioning and mounting the antenna

Mount the antenna on the roof of the vehicle and away from other installed devices that may obstruct the line of sight between the antenna and the satellite. The rubber pads of the magnetic mounts must make full contact with the vehicle's metal roof.

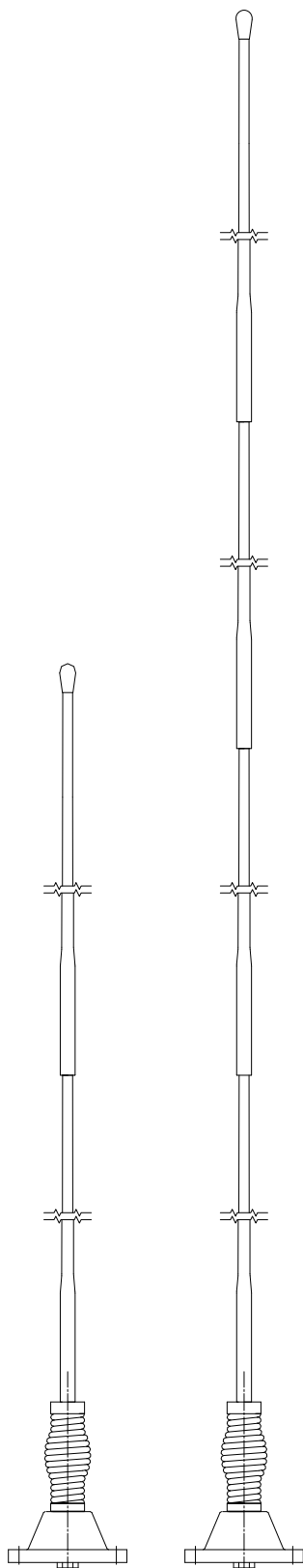
Orient the antenna connectors in the direction of the cable run to the terminal.





# COMROD APX50

## HF Mobile Whip Antenna



2 sections

4 sections

### Application:

The APX50 is constructed for land mobile services in the HF-band 2 - 30 MHz. It consists of four mast sections and a base section. The base section is equipped with heavy duty spring coil to absorb shocks and to allow for a semi permanent deflection of the antenna when moving the vehicle. To give better performance on lower frequencies, it is possible to add one section. To reduce visual signature the antenna can also be used with only two sections.

### Electrical specifications:

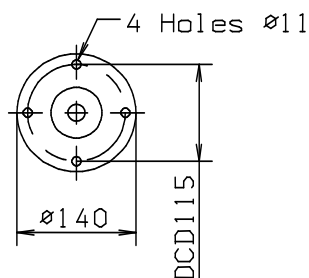
Frequency range	2-30 MHz
Impedance	Depending on mounting
Power rating	400 W
Radiation diagram	Omnidirectional
Polarization	Vertical

### Mechanical specifications:

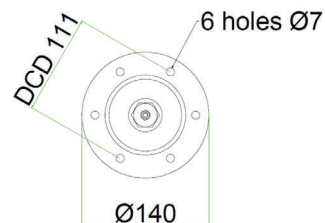
Design	End fed whip. Radiating elements completely enclosed in epoxy/fibreglass laminate. Metal parts are brass and stainless steel.
Length	2 sections: 2600mm 4 sections: 5000mm
Weight	4 sections: 4.5 kg
Finish	Polyurethane lacquer, olive
Temperature range	-55 °C, +71 °C; -67 °F, +160 °F

### Mounting:

The base fits onto a standard NATO four-bolt pattern. An optional six hole pattern is also available.

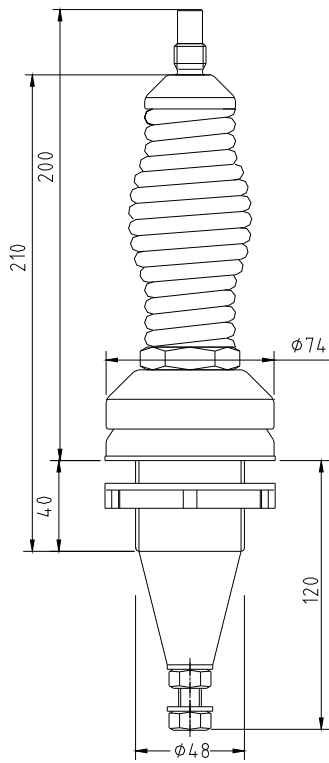


Standard 4-hole Mounting

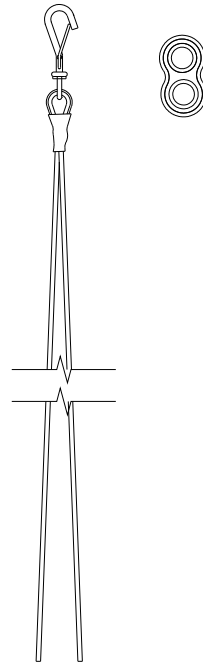


Optional 6-hole Mounting

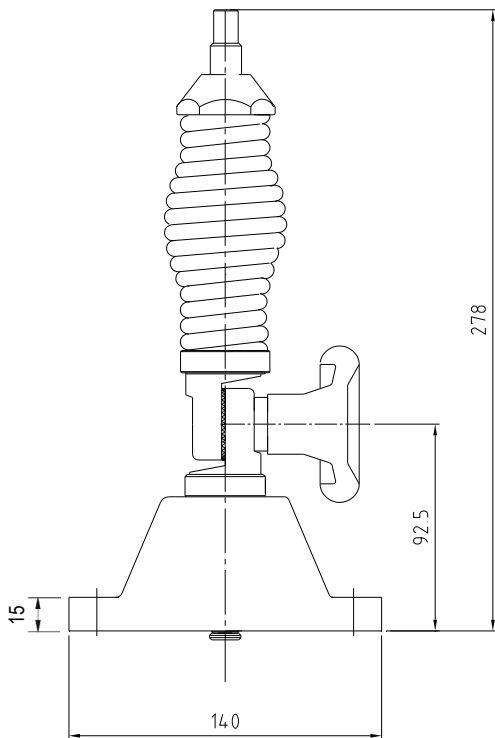
Options:



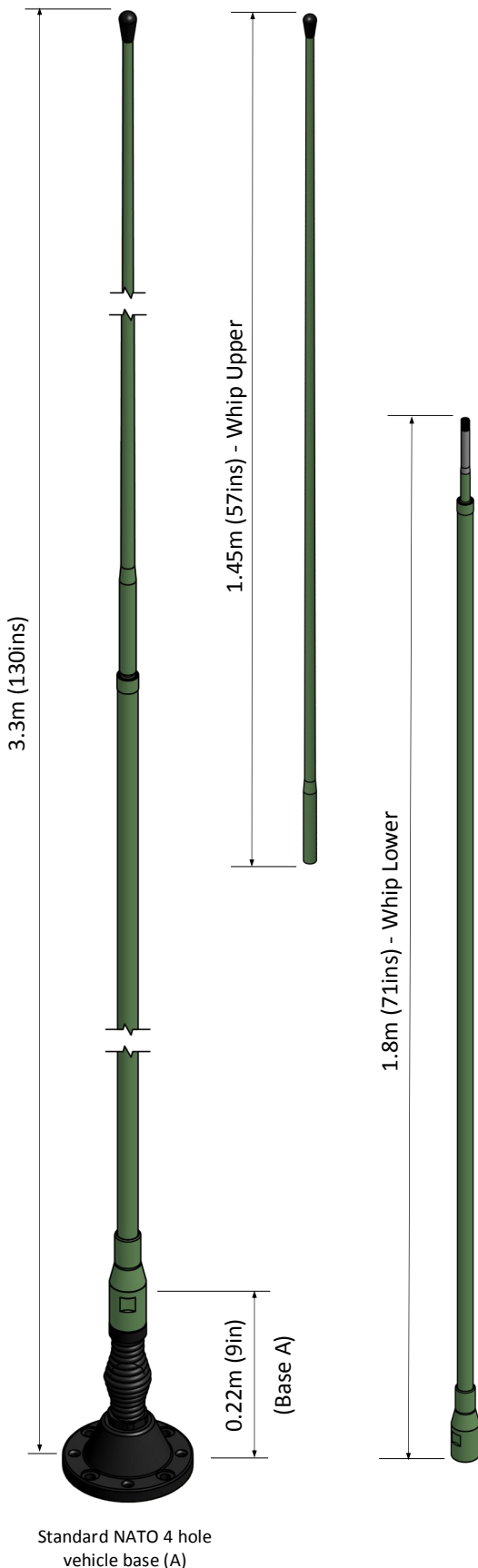
50 m.m. base



Tie down kit



Base w/tilting, 8mm spring



### Application

The VHF30108VM is a VHF vehicle antenna designed for use on all modern in-service military platforms, including armoured or soft skin, metal chassis or composite, wheeled or tracked.

The antenna is a dipole design so does not require a ground plane to operate.

Bases are available for vehicle, mast and fixed mounting with optional L1 & L1/L2 GPS.

### Electrical Specification (Antenna)

Frequency range	30 - 108 MHz
VSWR	See diagram
Nominal impedance	50 ohm
Power rating	100 W
Gain	See diagram
Radiation pattern	Azimuth: Omnidirectional Elevation: See overleaf
Polarisation	Vertical
Connector	BNC Female, others on request

### Mechanical specifications:

Design	Centre fed dipole. Radiating elements completely enclosed in epoxy/fibreglass laminate. Metal parts are plated brass and stainless steel.
Length <sup>#</sup>	Total: 3.3 m (130 in) Lower Whip: 1.8 m (71 in) Upper Whip: 1.45 m (57 in) Base (Option A): 0.22 m (9 in)
Weight	Whips - 1.65 kg (3.6 lbs) Complete - 3.4 kg (7.5 lbs)*
Wind rating	55 m/s = 125 mph
Finish	Polyurethane lacquer.
Colour	Customer Specified
Installation	See base option table
Temperature range	-55 °C, +71 °C; -67 °F, +160 °F

\* Weight with standard NATO 4 hole vehicle base. Base options specified overleaf.

# Nominal dimensions subject to manufacturing tolerances.

## GPS Electrical Specification

Configuration	L1 GPS	L1/L2 GPS
Frequency Band	1575.42 ± 10 MHz	L1 1575.42 ± 10 MHz L2 1227.60 ± 10 MHz
Supply Voltage	2.7-5.5V	2.7-5.5V
Pre-amplifier	26.5 dB @ 5V	26.5 dB @ 5V
Noise Figure	2.5dB	2.5dB
Supply Current	< 40mA	< 60mA
Polarisation	RHCP	RHCP
Connector	SMA female	SMA female

## Antenna Base Options

Bases are available to suit most installations including vehicle, mast and shelter mounting. Many are available with optional L1 & L1/L2 GPS. All bases are supplied with a protective top cap. See below for mounting options:-



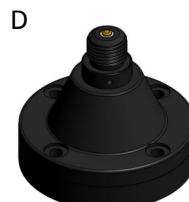
NATO 4-hole Spring  
4 x M10 or 3/8" Bolts  
on 114mm (4.5in) PCD  
Base diameter 140mm (5.5in)  
Base height 215mm (8.5in)



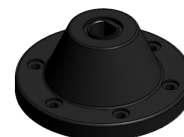
NATO 4-hole Spring GPS  
4 x M10 or 3/8" Bolts  
on 114mm (4.5in) PCD  
Base diameter 140mm (5.5in)  
Base height 240mm (9.5in)



NATO 4-hole Rigid  
4 x M10 or 3/8" Bolts  
on 114mm PCD  
Base diameter 140mm (5.5in)  
Base height 100mm (4in)



NATO 4-hole Rigid GPS  
4 x M10 or 3/8" Bolts  
on 114mm (4.5in) PCD  
Base diameter 140mm (5.5in)  
Base height 125mm (5in)



Bases A,B,C & D are also  
available with optional  
NATO 6-hole pattern  
6 x M6 or 1/4" Bolts  
on 111mm (4.37in) PCD



NATO 50mm Thread  
with Spring  
Base diameter 74mm (2.9in)  
Base height 188mm (7.4in)



NATO 50mm Thread GPS  
with Spring  
Base diameter 95mm (3.7in)  
Base height 230mm (9in)



NATO 50mm Thread  
Rigid  
Base diameter 74mm (2.9in)  
Base height 60mm (2.4in)



General Purpose  
Bulkhead Adaptor  
Mounting hole diameter  
22mm (0.87in)



Mast Mount Bracket  
40mm (1.57in) Socket  
50mm (1.97in) Socket  
Customer Specified

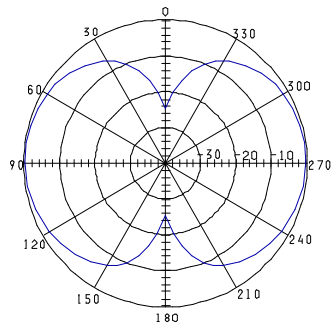


Mast Mount Bracket  
24mm (0.94in) Spigot  
40mm (1.57in) Spigot  
50mm (1.97in) Spigot  
Customer Specified

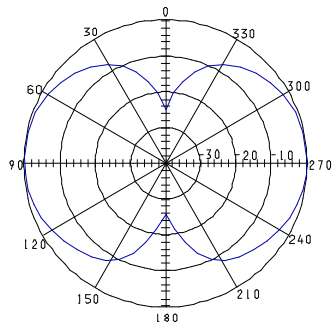
## Antenna Options

Product	Description
Whip Bag	Protective carrying bag for upper and lower whip sections.
Tie Down Kit	Allows the whip to be tied down to the vehicle while in motion.

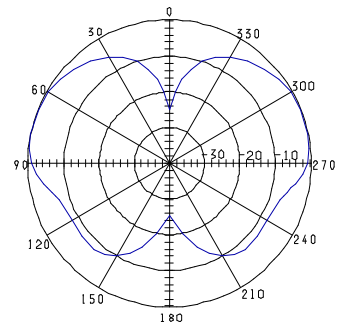
## Radiation Diagram, Elevation:



30MHz

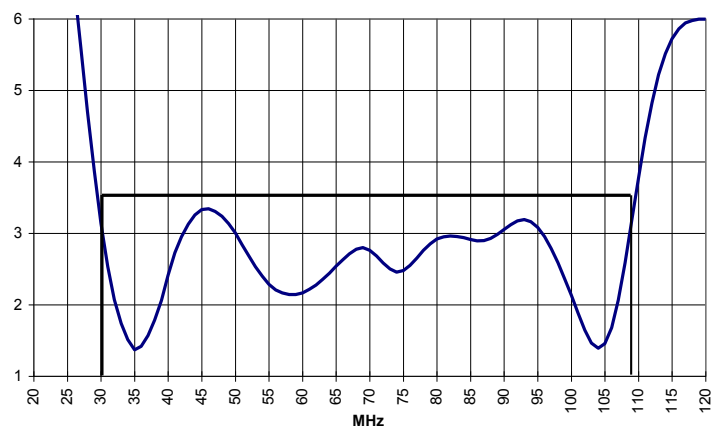


60MHz



88MHz

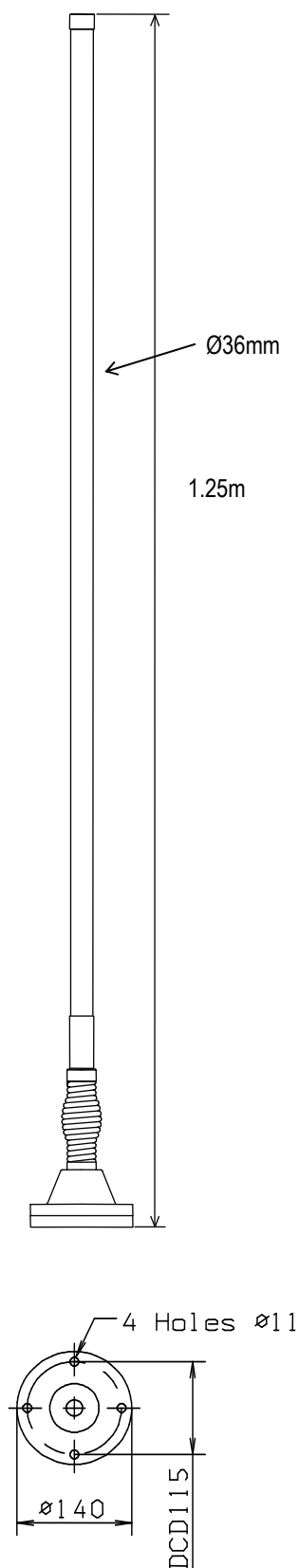
## VSWR





# COMROD VHF100512VM

## VHF/UHF Broadband Antenna



### Application:

The VHF100512VM is a broadband antenna covering the complete 100 to 512MHz range. It is intended to be used on all kinds of vehicles including Jeeps, Trucks and Armoured vehicles.

The antenna needs no adjustments for different frequencies, and all the tuning elements are within the whip.

Diplexers for use with two transceivers can be delivered.

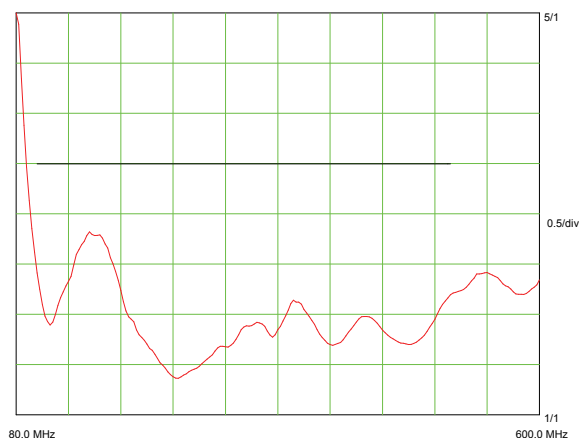
### Electrical specifications:

Frequency range	100-512MHz
VSWR	≤ 3.5
Nominal impedance	50 ohm
Power rating	50 W +0.8dB, 10 min
Gain	-5.. 1.5 dBi, see reverse side
Radiation pattern	Azimuth: Omnidirectional
Polarisation	Vertical
Connector	BNC female, others on request

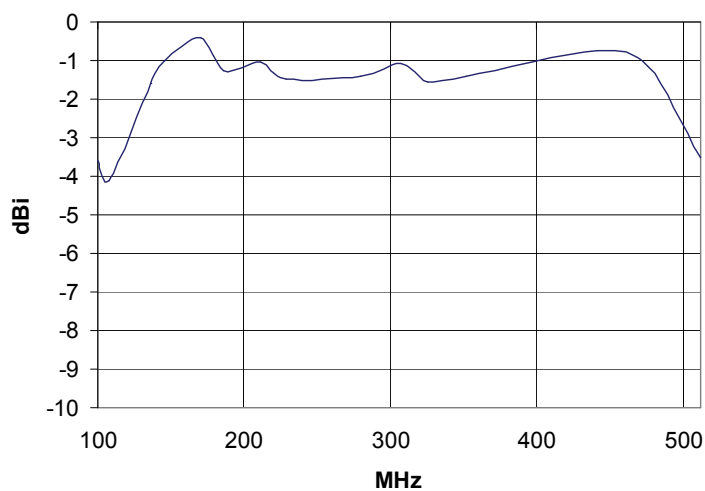
### Mechanical specifications:

Design	Broad band centre fed dipole. Radiating element completely enclosed in epoxy/fibreglass laminate. Metal parts are brass and stainless steel.	
Length	Total:	1.25m
	Whip:	1.05m
	Base:	0.23m
Weight	Total:	3.65kg
	Whip:	1.4kg
	Base:	2.25kg
Wind rating	55 m/s = 125 mph	
Finish	Polyurethane lacquer, olive drab, other colours on request.	
Temperature range	-55 °C, +71 °C; -67 °F, +160 °F	
Installation	Standard 4 hole NATO base with spring	

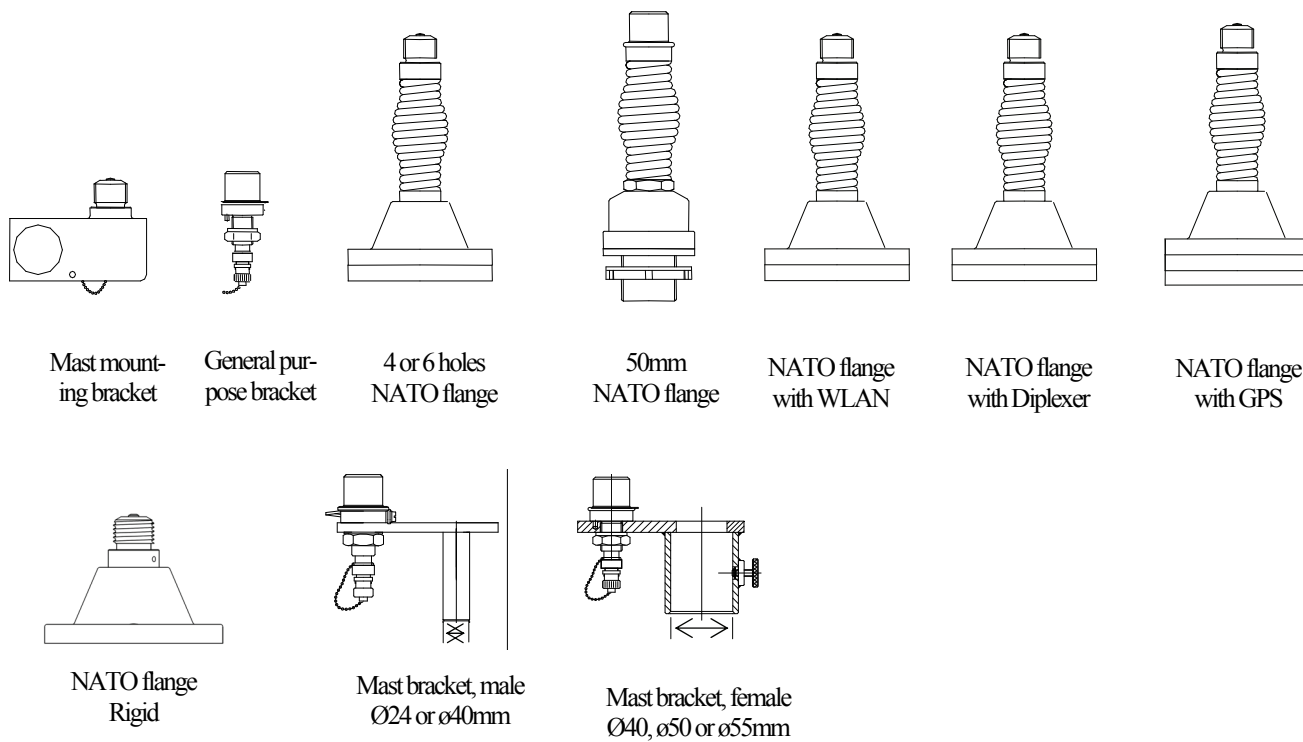
VSWR



Gain



### Optimal bases with CEF -connection



#### Application

The VHF30512CEF is an ultra wideband vehicle antenna designed for use on all modern in-service military platforms, including armoured or soft skin, metal chassis or composite, wheeled or tracked.

The novel design gives it an excellent gain and radiation pattern across the whole frequency range. The antenna needs no adjustment for different frequencies as all the tuning elements are within the whip.

Bases are available to suit different mounting configurations with optional dual feed connectors and L1 & L1/L2 GPS.

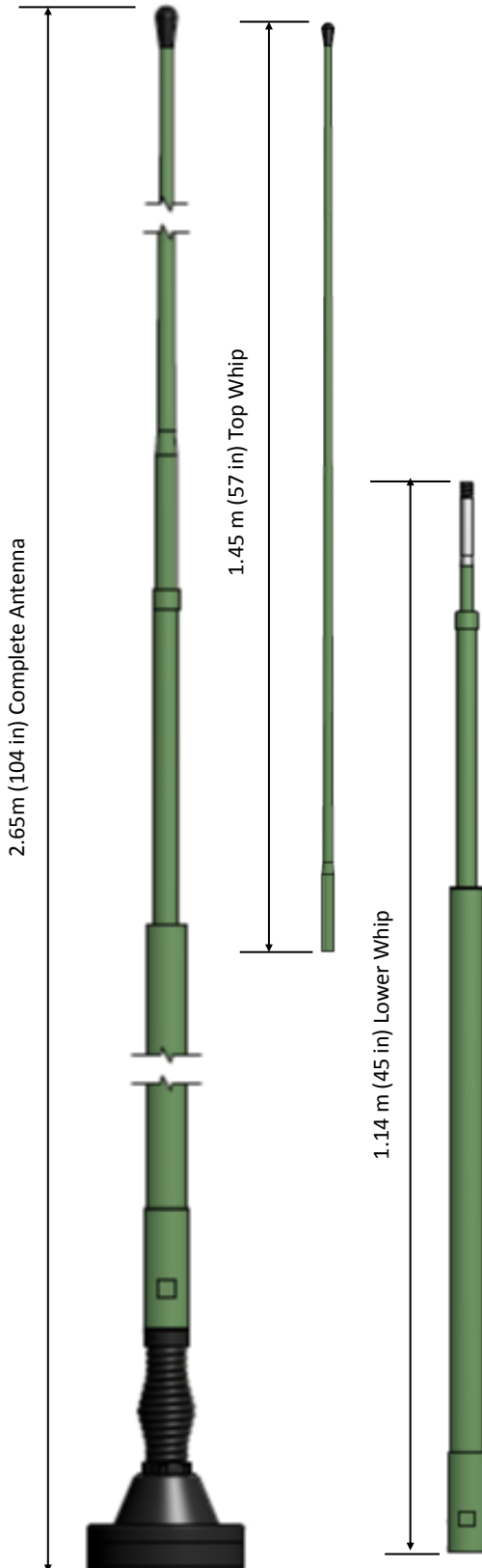
#### Electrical Specification (Antenna)

Frequency range	30 - 512MHz
VSWR	< 3.5, see diagram
Nominal impedance	50 ohm
Power rating	50 W
Gain	-5 to 1.5 dB rel. ¼ wave dipole see diagram overleaf
Radiation pattern	Azimuth: Omnidirectional
Polarisation	Vertical
Connector	BNC female, others on request

#### Mechanical specifications:

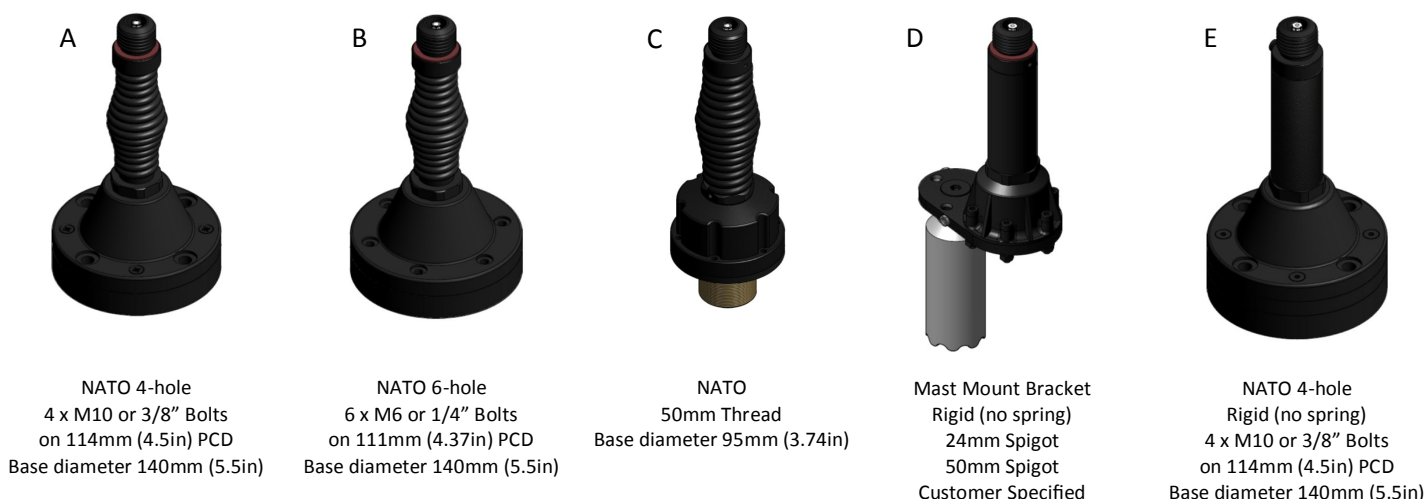
Design	Centre fed dipole for UHF. End-fed whip for VHF. Radiating element completely enclosed in epoxy/fibreglass laminate. Metal parts are plated brass and stainless steel.	
Length	Total:	2.65m (104 in)
	Lower whip:	1.14m (45in)
	Upper whip:	1.45m (57in)
	Base:	0.24m (9.5in)
Weight	Total:	3.75kg (8.2lbs)*
	Lower whip:	1.2kg (2.6lbs)
	Upper whip:	0.3kg (0.7lbs)
	Base:	2.25kg (5lbs)*
Wind rating	55 m/s = 125 mph	
Finish	Polyurethane lacquer	
Colour	Customer Specified	
Installation	See base option table	
Temperature range	-55 °C, +71°C; -67 °F, +160 °F	

\* Weight with standard NATO 4 hole base. Base options specified overleaf.



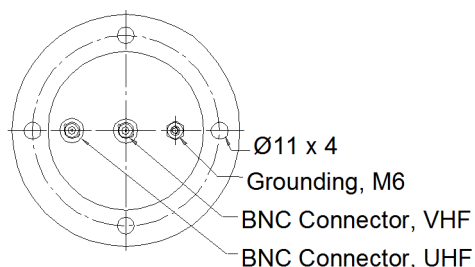
Description	Antenna Base	Base Image	Feed	VHF Connector	UHF Connector	L1 GPS Option	L1/L2 GPS Option
Broadband 30-512 MHz	NATO 4 Hole	A	Single	BNC Female		✓	✓
Broadband 30-512 MHz	NATO 4 Hole	A	Single	N Type Female		✓	✓
Broadband 30-512 MHz	NATO 4 Hole Rigid	E	Single	N Type Female		✓	✓
Broadband 30-512MHz	NATO 6 Hole	B	Single	BNC Female		✓	✓
Broadband 30-512 MHz	NATO 6 Hole	B	Single	N Type Female		✓	✓
Broadband 30-512 MHz	NATO 50mm Thread	C	Single	BNC Female		✓	✓
Broadband 30-512 MHz	Mast Mount	D	Single	BNC Female		X	X
Dual-band 30-88 & 116-512 MHz	NATO 4 Hole	A	Dual	BNC Female	BNC Female	✓	✓
Dual-band 30-88 & 116-512 MHz	NATO 6 Hole	B	Dual	BNC Female	BNC Female	✓	✓

### Base Options



### Dual Feed

Dual feed bases incorporate a diplexer to enable the antenna to operate as a dual band VHF 30-88MHz, UHF 116-512MHz  
Below is a typical NATO 4-Hole base with BNC/BNC Dual Feed

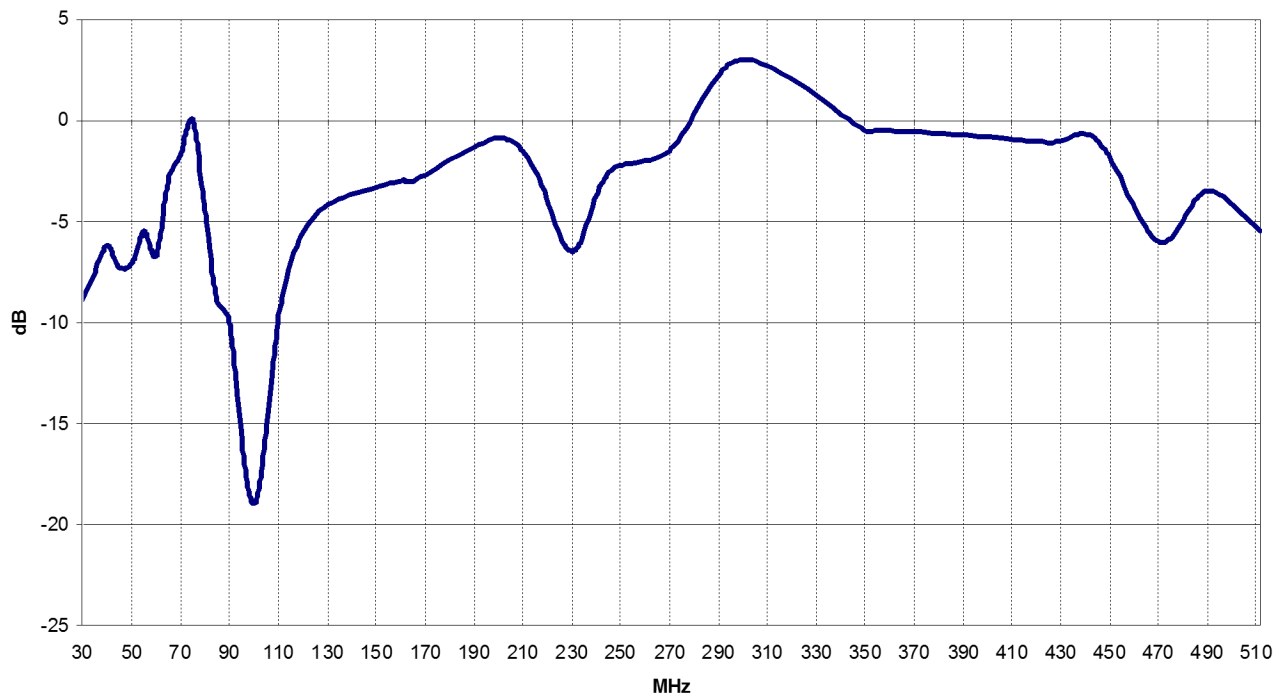


### GPS Electrical Specification

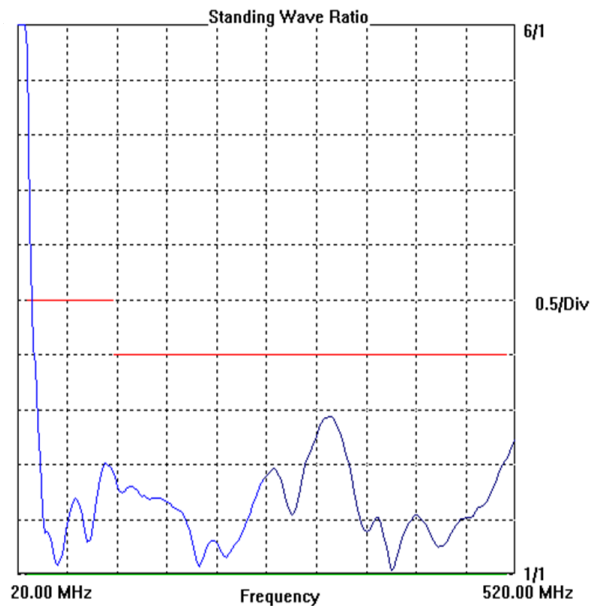
	L1 GPS	L2 GPS
Frequency Band	1575.42 ± 10 MHz	1227.60 ± 10 MHz
Supply Voltage	2.7-5.5V	2.7-5.5V
Pre-amplifier	26.5 dB @ 5V	26.5 dB @ 5V
Noise Figure	2.5dB	2.5dB
Supply Current	< 60mA	< 60mA
Polarisation	RHCP	RHCP
Connector	SMA female	SMA female

### Antenna Options

Product	Description
Whip Bag	Protective carrying bag for upper and lower whip sections.
Tie Down Kit	Allows the whip to be tied down to the vehicle while in motion.

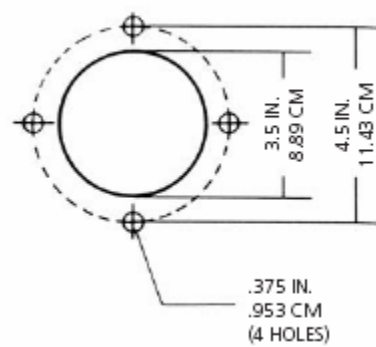
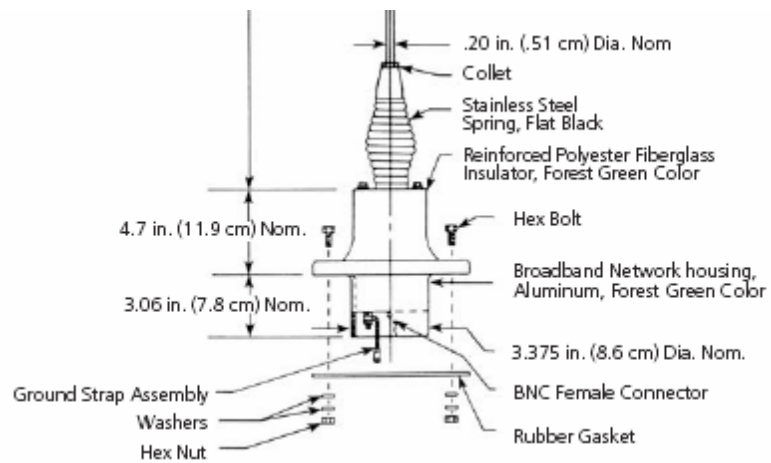


Gain relative to a 1/4 wave whip  
Antenna installed in the centre of a 3 x 3m ground plane



VSWR Curve  
(Single feed Wideband Configuration)

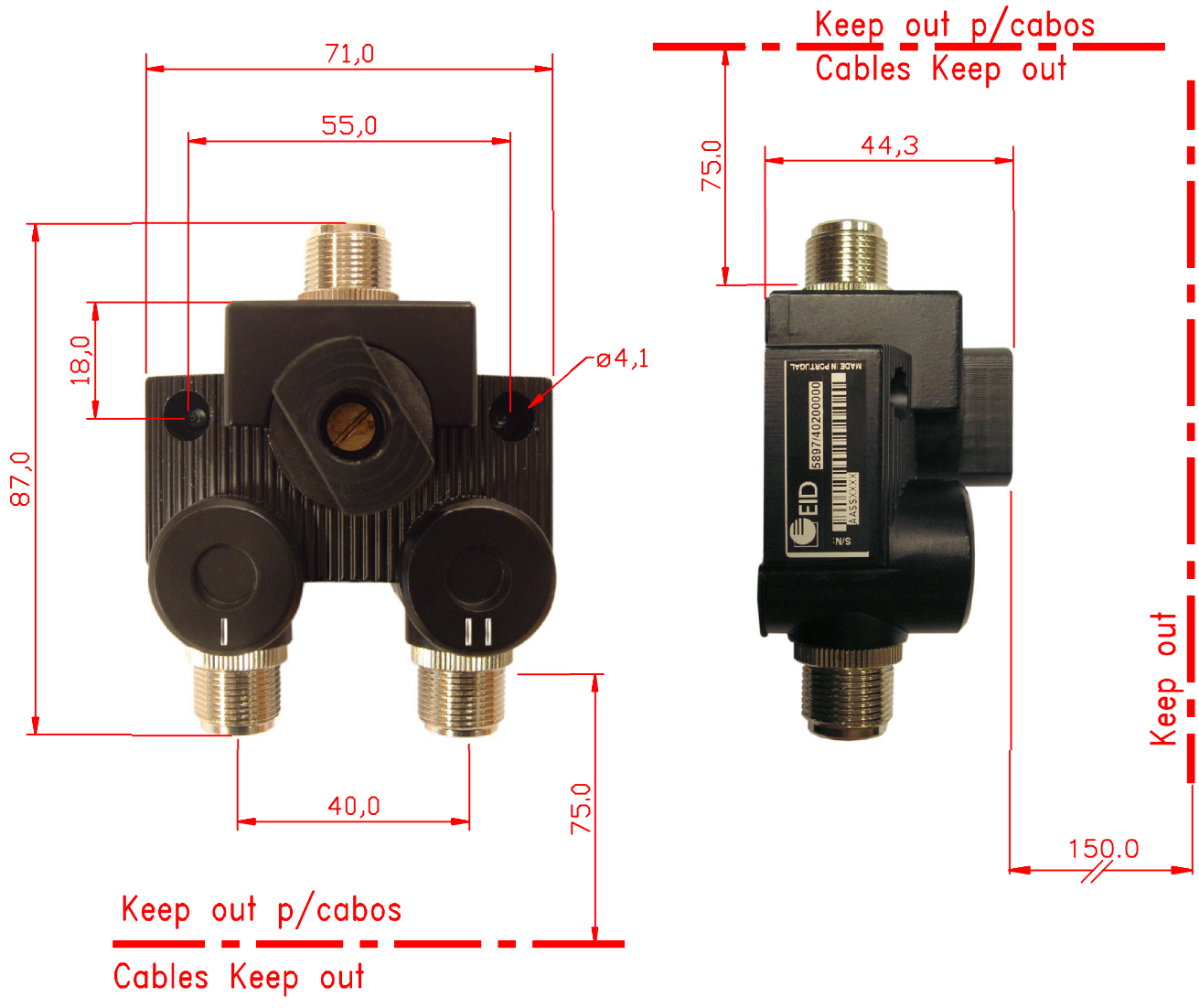




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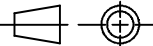
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A  
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Salvo indicação em contrário, todas as cotas estão em milímetros  
Unless otherwise specified, all dimensions are in millimeters

ARQ

						
1	2007-04-24		GAP	JBC	DSV	
ED. Rev.	DATA Date	NOTAS DE EDIÇÃO Revision Notes	EXEC. Drawn	VERIF. Check.	APROV. Approv.	
CAD		TOL:	Outline Drawing Antenna Switch			COD:
F:						5897/40200000DA
		ESC: Scale:				FL: 1/1 Sh: