



amateur
amateur



fire rescue
fire rescue



air band
air band



rescue
rescue



marine
marine

2009
2010

VHF-UHF HAM

Antennas designed and manufactured in Italy

Technological Research, Quality, Assurance

The history of Sirio Antenne Dates to the early-1970s when our Director, Giuseppe Grazioli founded the company. The product offering was a diverse mix of high quality antennas, serving primarily the German and Italian market. During this 30 year the company has experienced considerable growth on the international market and earned a reputation as a reliable, high quality supplier to the industry in the field of communication. Thanks to its high quality standards, technological research and know-how, Sirio Antenne has been able to develop a wide range of products in accordance with demand from the market.

We are listening to our customers. Providing efficient, effective solutions to their needs as expressed by them. TRY US!

QUALITY SYSTEM

SIRIO antennae is a qualified ISO9001:2000 company since February 2004 Certification issued by international company DNV



Research & Development Department

SIRIO Antenne develops OEM Projects upon customers' request



CAD station for mechanical design



3D electromagnetics computer simulator



Microwave anechoic chamber.



Open site antenna measurement



RF & Microwave lab.



Computer controlled climatic chamber

PRODUCTION DEPT



Mobile antennas production department



Base antennas production department



Final test with network analyzer



CNC winding machine



Ultrasonic welding machine

MACHINES SHOP



HURCO machining centre



BIGLIA CNC-lathe



GILDEMEISTER Sliding headstock CNC-lathe



Moulds and equipments production: milling machine and spark erosion machine



CITIZEN Sliding headstock CNC-lathe

WAREHOUSE DEPT



Incoming quantity check



Storing area zone A



Storing area zone B



REFERENCE TABLE



Here below you'll find some tables that will help you find out the most suitable product for your purpose more easily in the catalogue.

1) CHOOSE THE TYPE OF INSTALLATION. BASE station antennas are in table **A**, MOBILE antennas (vehicular or portable) are in table **B** and MARINE antennas are in table **C**.

2) CHOOSE THE FREQUENCY. At the top of the table you can choose your desired frequency range. If it is not mentioned, you can select the nearest one.

3) CHOOSE THE PRODUCT. Follow the vertical line of the chosen frequency range till you find the **coloured squares** that show the frequency bands covered. The name of the product and its corresponding data page is on the left side. You can easily find the page of your selected product.

ADDITIONAL INFORMATION

RED: means that the antenna is **TUNABLE**. The product doesn't cover the full band but just a part of it and the fine tuning can be obtained only by tuning one or more elements of the aerial. When the chosen frequency is written in this way 140...175 MHz it means that the product requires tuning.

BLUE: means that the antenna has a **FIXED** band and cannot be modified. No tuning is required and the corresponding frequency range is covered within a SWR limit indicated in the product's electrical data. In this case the frequency range will be indicated as: 400 - 470 MHz.

TABLEAUX DE REFERENCES

Vous trouverez ci-dessous des tableaux qui faciliteront la recherche d'un produit dans le catalogue. La procédure de recherche est la suivante:

1) CHOISIR LE TYPE D'INSTALLATION: les antennes de stations **FIXES** sont dans le tableau **A**. Les antennes **MOBILES** et **PORTABLES** sont dans le tableau **B**. Les antennes **MARINES** sont dans le tableau **C**.

2) CHOISIR LA FREQUENCE: en haut du tableau, choisissez la bande de fréquences désirée. Si elle n'est pas mentionnée, veuillez choisir celle qui s'en rapproche le plus.

3) CHOISIR LE PRODUIT: suivez la ligne verticale de la gamme de fréquences choisie jusqu'à ce que vous trouviez les **emplacements colorés** qui désignent les bandes de fréquences couvertes. Le nom du produit et la page correspondante dans le catalogue sont sur le côté gauche. Vous trouverez ainsi plus facilement la page du produit sélectionné.

INFORMATIONS COMPLEMENTAIRES

ROUGE: veut dire que l'antenne est **RÉGLABLE**. Le produit ne couvre pas totalement la bande complète mais juste une partie et le bon réglage peut être obtenu seulement en réglant un ou plusieurs éléments de l'aérien. Quand la bande de fréquences est séparée de 3 points: 140...175 MHz, cela signifie qu'il faut régler le produit.

BLEU: veut dire que l'antenne a une bande de fréquences **FIXE** et qu'on ne peut pas la modifier. Aucun réglage n'est nécessaire et la limite de SWR de la bande de fréquences couverte est indiquée dans les données électriques du produit. Dans ce cas, le début et la fin de la bande de fréquences sera séparée par un tiret: 400-470 MHz.



TABELLE DI RICERCA



Qui di seguito sono riportate alcune tabelle con lo scopo di facilitare la ricerca dei prodotti. La procedura di ricerca consiste in:

1) SCELTA TIPO DI INSTALLAZIONE. Antenne per **stazione BASE** sono riportate in tabella **A**, antenne **MOBILE** per installazione su veicoli e/o per apparecchi portatili in tabella **B** e **NAUTICHE** in tabella **C**.

2) SCELTA FREQUENZA DI LAVORO. Individuare nella **riga superiore** della tabella la frequenza di lavoro desiderata. Se non fosse riportata individuare quelle più vicine.

3) SCELTA PRODOTTO. Scorrere la riga verticale corrispondente alla frequenza di lavoro voluta fino ad incrociare i **rettangoli colorati** che indicano la banda di frequenza coperta. Pagina e modello sono riportati sulla stessa riga alla sinistra dei rettangoli così individuati. Consultare quindi la pagina del prodotto per conoscere tutte le particolarità.

INFORMAZIONI AGGIUNTIVE

ROSSO: indica che l'antenna è **SINTONIZZABILE**. L'antenna non copre tutta la banda dichiarata contemporaneamente ma solo una sua porzione e la frequenza di lavoro dovrà essere scelta agendo sulla lunghezza di uno o più elementi dell'antenna stessa. La banda di frequenza indicata sarà separata da 3 puntini (es. 140...175 Mhz).

AZZURRO: indica che l'antenna ha una banda **FISSA** non modificabile. Non occorre tarare nulla e tutta la banda dichiarata è coperta entro un limite di SWR specificato. In questo caso nella pagina del prodotto gli estremi della frequenza di lavoro saranno separati da un trattino (es. 400 - 470 Mhz).



INDICE



A continuación algunas referencias para facilitar la búsqueda de los productos. El procedimiento de la búsqueda consiste en:

1) TIPO DE INSTALACIÓN ELEGIDA. Antenas para estación **BASE** indicadas en la tabla **A**, antenas **MÓVILES** para la instalación en vehículos y/o para los equipos portátiles, en la tabla **B** y antenas **MARINAS** en la tabla **C**.

2) ELECCION DE LA FRECUENCIA. Seleccione en la línea superior de la tabla, el rango de frecuencia deseado. Si la frecuencia de trabajo no está indicada, usted puede seleccionar la más cercana.

3) ELECCION DEL PRODUCTO. Siga la línea vertical correspondiente al rango de frecuencia escogida hasta que usted encuentra los **cuadrados coloreados** que muestran las bandas de frecuencia cubiertas. El nombre del producto y los datos correspondientes, está en el lado izquierdo de la página. De esta manera, usted puede encontrar la página de su producto fácilmente.

INFORMACION ADICIONAL

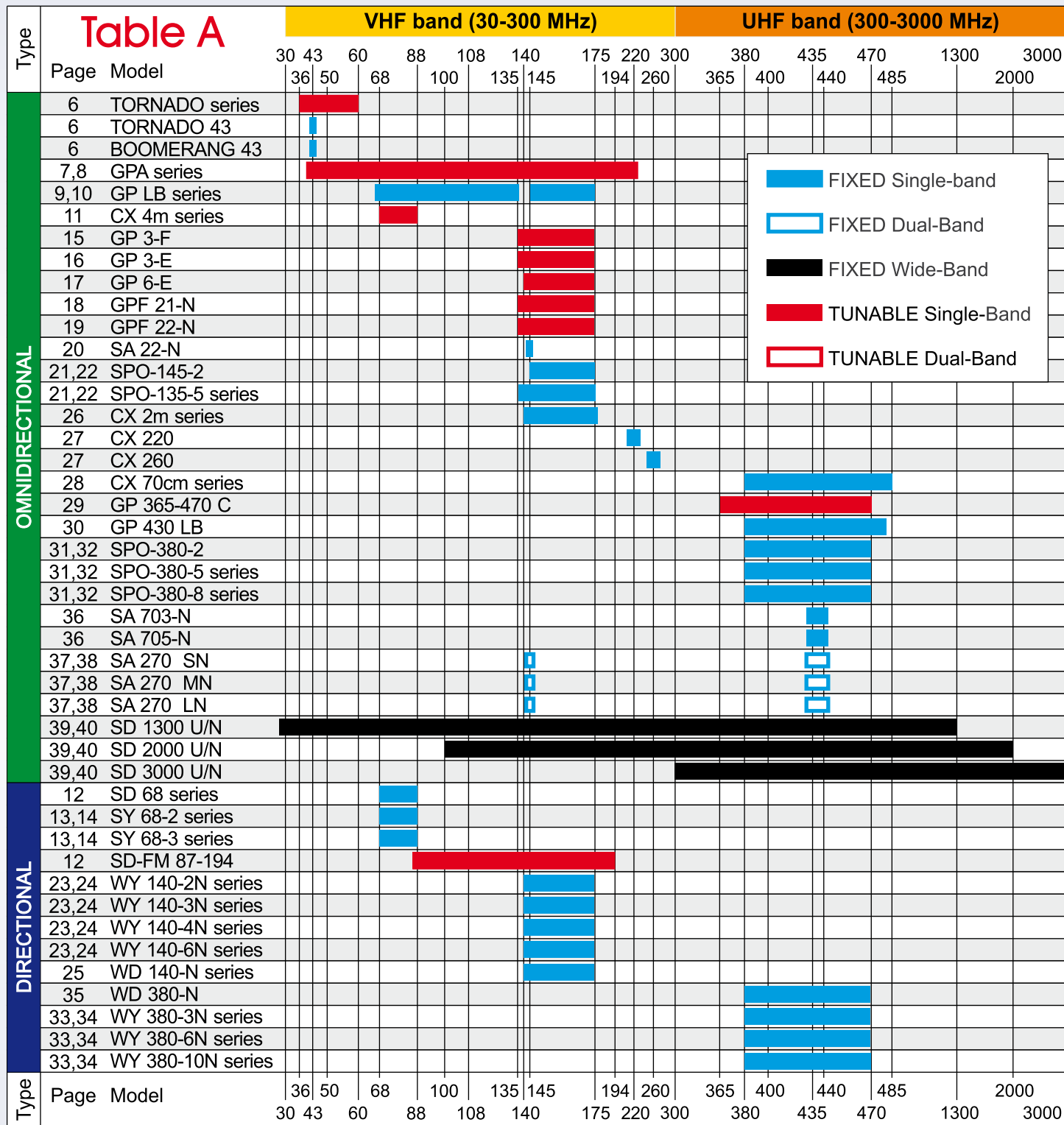
ROJO: indica que la antena es **SINTONIZABLE**. La antena no cubre toda la banda de frecuencia deseada, solo una parte. Deberemos seleccionar y ajustar la longitud de uno o más elementos de la antena. Cuando la banda de frecuencias se separa de 3 puntos: 140...175 MHz, eso significa qu'il es necesario regular el producto.

AZUL: indica que la antena es de banda **FIJA**, no es modificable. No requiere ningún ajuste. El rango de frecuencia esta en el limite del SWR. Ejemplo (400-470 MHz).

The frequencies table for the most common systems / Tabella delle bande di frequenze dei sistemi più utilizzati

Band	Frequency	System / Name	Band	Frequency	System / Name
VHF	30 - 68 MHz	Low Band	UHF	450 - 470 MHz	NMT 450
VHF	68 - 87.5 MHz	4m band	UHF	824 - 896 MHz	AMPS
VHF	87.5 - 108 MHz	FM radio	UHF	810 - 958 MHz	DoCoMo
VHF	108 - 136 MHz	Aircraft radio	UHF	880 - 960 MHz	GSM 900
VHF	146 - 174 MHz	2m band	UHF	890 - 960 MHz	NMT 900, Natel C
UHF	225 - 380 MHz	Aircraft radio	VHF	1575.42 MHz	GPS
UHF	380 - 400 MHz	TETRA (Terrestrial Trunked Radio)	UHF	1710 - 1880 MHz	PCN / GSM 1800, DCS 1800
UHF	400 - 470 MHz	70 cm band	UHF	1850 - 1990 MHz	PCS, DCS 1900 / GSM 1900
UHF	410 - 430 MHz	Trunking system, Chekker, Modacom, Mobitex	UHF	1920 - 2170 MHz	UMTS

Band Designation	Frequency MHz
HF (high frequency)	3 30 300 3000
VHF (very high frequency)	
UHF (ultra high frequency)	

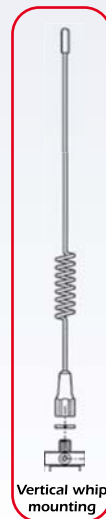
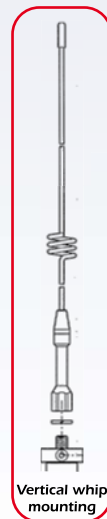
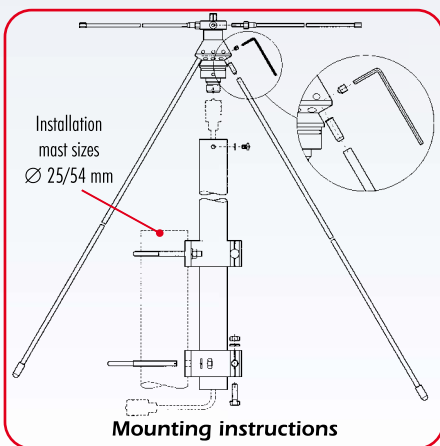
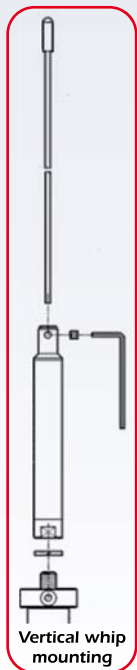


SD 1300 U/N, SD 2000 U/N, SD 3000 U/N

Sirio Discone Wide-band

Features:

- # Base station antenna, Omnidirectional, Unity-gain
- # Extremely wide-band suitable for scanner use
- # Transmission capability in several Ham bands
- # Perfect protection against the worst weather conditions
- # Stainless steel hardware and radials
- # Equipped with anodized aluminium bracket for an easy side mast installation
- # 17/7 PH stainless steel cylindrical whip



SD 1300 U/N

SD 2000 U/N

SD 3000 U/N



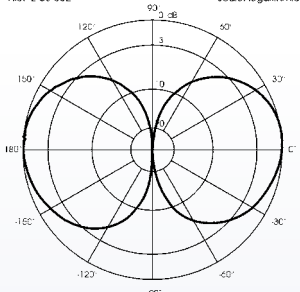
SD 1300 U/N, SD 2000 U/N, SD 3000 U/N

Sirio Discone Wide-band

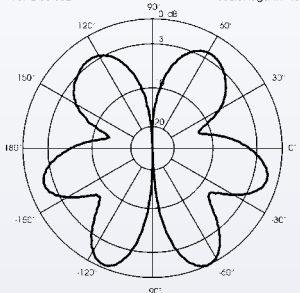
Electrical Data	SD 1300 U/N	SD 2000 U/N	SD 3000 U/N
Type	Discone		
Frequency Range	RX band: 25-1300 MHz TX band (@ SWR ≤ 2): 49.5-50.5, 120-180, 215-300, 415-465, 610-650, 710-1000, 1130-1300MHz	RX band: 100-2000 MHz TX band (@ SWR ≤ 2): 130-160, 215-440, 610-685, 870-960, 1070-1500, 1620-1800, 1860-2000MHz	RX band: 300-3000 MHz TX band (@ SWR ≤ 2): 340-535, 545-960, 1180-1380, 1660-1910, 1980-3000 MHz
Impedance	50 Ω		
Radiation (H-plane)	360° Omnidirectional		
Radiation (E-plane)	Frequency dependent, see the pattern		
Radiation angle deg.	Frequency dependent, see the pattern		
Polarization	Linear Vertical		
Gain	0 dBd - 2.15 dBi @ lowest frequency		
Max Power (CW) @ 30°C	VHF: 300 Watts, UHF: 200 Watts	200 Watts	200 Watts
Connector	UHF-female, gold plated central pin or N-female, gold plated central pin		
Mechanical Data			
Materials	Stainless Steel, Chromed Brass, Aluminium, Nylon		
Wind Load @ 150 km/h	66 N	44 N	32 N
Wind Resistance	130 Km/h	150 Km/h	150 Km/h
Wind Surface	0.06 m²	0.04 m²	0.03 m²
Height (approx.)	1600 mm	900 mm	725 mm
Weight (approx.)	1140 gr	1020 gr	830 gr
Cone Radial Length	810 mm	550 mm	270 mm
Mounting Mast	Ø 25-54 mm		
P/N with UHF connector	2105405.00	2109005.00	2109205.00
P/N with N connector	2105505.00	2109105.00	2109305.00

SD 1300 U/N

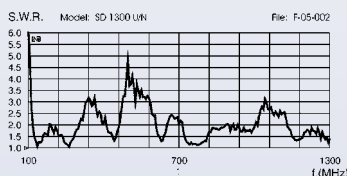
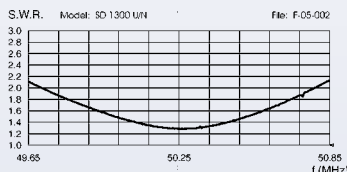
TYPICAL RADIATION PATTERN in E-plane at 145 MHz
File: E-05-002 Scale: logarithmic



TYPICAL RADIATION PATTERN in E-plane at 437 MHz
File: E-05-002 Scale: logarithmic

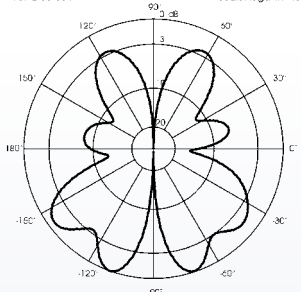


TYPICAL S.W.R. RESPONSE

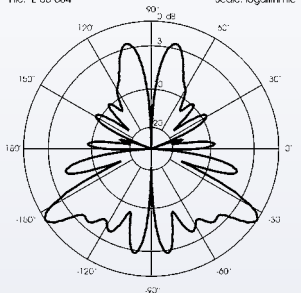


SD 2000 U/N

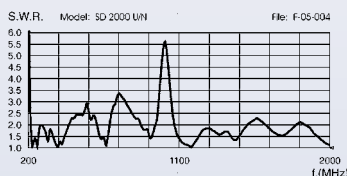
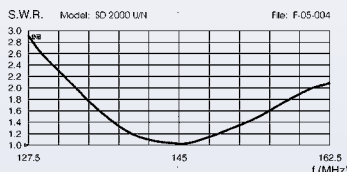
TYPICAL RADIATION PATTERN in E-plane at 915 MHz
File: E-05-004 Scale: logarithmic



TYPICAL RADIATION PATTERN in E-plane at 1800 MHz
File: E-05-004 Scale: logarithmic

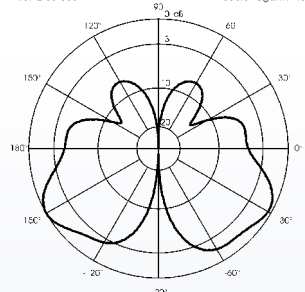


TYPICAL S.W.R. RESPONSE

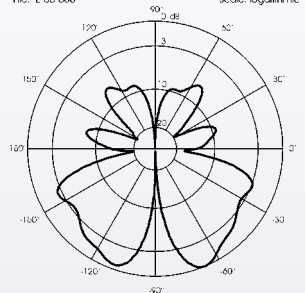


SD 3000 U/N

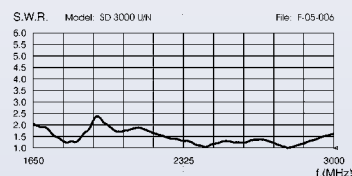
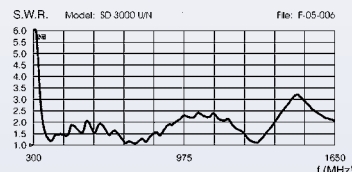
TYPICAL RADIATION PATTERN in E-plane at 915 MHz
File: E-05-006 Scale: logarithmic



TYPICAL RADIATION PATTERN in E-plane at 1800 MHz
File: E-05-006 Scale: logarithmic



TYPICAL S.W.R. RESPONSE





"S" Mount

Frequency Range: from DC to 300 MHz
 Overall Size: \varnothing 42 mm
 Mounting Hole: \varnothing 19 mm
 1 "S" Chrome 2501002.01
 2 "S" Black 2501002.02



"SL" Mount

Frequency Range: from DC to 500 MHz
 Overall Size: \varnothing 39 mm
 Mounting Hole: \varnothing 19 mm
 1 "SL" Chrome 2501102.01
 2 "SL" Black 2501102.02



"SL-S" Mount

Frequency Range: from DC to 500 MHz
 Overall Size: \varnothing 39 mm
 Mounting Hole: \varnothing 19 mm
 "SL-S" Black 2501102.04



"ML" Mount

Frequency Range: from DC to 1000 MHz
 Overall Size: \varnothing 30mm
 Mounting Hole: \varnothing 14 or 18 mm
 "ML" 2501202.06



"Screw & Bolt"

Materials: Chrome plated Brass and Zamak
 1 Chrome 2506206.00
 2 Black 2506207.00



"Wing Bolt"

Materials: Chrome plated Brass
 1 Chrome 2506306.00
 2 Black 2506307.00



"Safety Set"

Materials: Chrome plated Brass and Zamak
 1 Chrome 2506506.00
 2 Black 2506507.00



"TRUNK TOP 2" Mount

Cable / Connector: 5.5m RG 58 / UHF-male
 Connection: UHF-female or DV joint
 DV to PL Chrome 2504406.12
 DV to PL Black 2504407.13



"ABN" Trunk Mount

Fixing Hole: \varnothing 16 mm
 Material: Painted Steel
 ABN Black 2504105.00



"KF" Gutter Mount

Fixing Hole: \varnothing 16 mm
 Material: Painted Zamak
 1 KF Black only 2504205.00
 1 + 2 KF Black w/Cable SO239 2504205.20



"FT-2 Universal", "FT-3", "FT-4" Fixing Bracket

Top Size for antenna fitting: FT-2, FT-4 = \varnothing 38 mm, FT-3 = \varnothing 30 mm
 Bottom Size: FT-2 = \varnothing 45/50 mm most fitting, FT-3 = \varnothing 35/54 mm most fitting, FT-4 = 2x \varnothing 9 mm wall fitting (screws not included).
 Weight (approx.): FT-2 = 1100 gr, FT-3 = 350gr, FT-4 = 780gr
 Material: FT-2, FT-4 = Galvanized Steel, FT-3 = Anodized aluminium, Stainless steel
 FT-2 Universal 2510004.00, FT-3 2511301.00, FT-4 2513404.00



"M-1", "M-2" Marine Brackets

Dimension: M1: 38x64x98mm, M2: 38x100x180mm
 Material: Stainless Steel. Mounting Hole: 2x \varnothing 16mm
 1 M-1 Marine Bracket 2503503.00
 2 M-2 Marine Bracket 2503203.00
 3 With Optional fixing set 2503203.00/SA or 2503503.00/SA



"M-3" Marine Mount

Connection: standard 1"x14 threads
 Dimension L x W x H : 60 x 95 x 130 mm
 Weight (approx.): 860 gr
 Materials: Chromed Brass, Stainless steel hardware
 M-3 OT Marine Mount 2503606.00



"M-8" Marine Mount

Connection: standard 1"x14 threads
 Dimension L x W x H : 67 x 94 x 124 mm
 Weight (approx.): 330 gr
 Materials: Nylon, Stainless steel hardware
 M-8 NY Marine Mount 2503301.00



"M-10" Marine Mount

Connection: standard 1"x14 threads
 Fixing diameter: 1"
 Weight (approx.): 600 gr
 Materials: Chromed Brass, Stainless steel hardware
 M-10 OT Marine Mount 2503406.00



"MAG H 12" Magnet Mount

Frequency Range: from DC to 500 MHz. Overall size: Ø 92 mm
 Materials: Ferrite magnet, Chromed Brass, Nylon, Rubber protection
 Cable / Connector: 3.6 m RG 58 / PL 259 R male

MAG H 12 PL	2502502.05
MAG H 12 S	2502502.01
MAG H 12 S Black	2502502.02
MAG H 12 3/8	2502502.03



"MAG 145" Magnet Mount

Frequency Range: from DC to 500 MHz. Overall size: Ø 160 mm
 Materials: Ferrite magnet, Chromed Brass, Nylon, Rubber protection
 Cable / Connector: 3.6 m RG 58 / PL 259 R male

MAG 145 PL	2502702.05
MAG 145 S	2502702.01
MAG 145 S Black	2502702.02
MAG 145 3/8	2502702.03



"HP MAG H 12 PL" Magnet Mount

Frequency Range: from DC to 500 MHz
 Overall size: Ø 92 mm
 Materials: Ferrite magnet, Chromed Brass, Nylon, Rubber protection, Teflon insulator, Gold plated pin
 Cable: 3.6m RG58 C/U MIL C17
 HP MAG H 12 PL

2511802.05



"HP-AC/U" Angular Connector

Frequency Range: from DC to 500 MHz.
 Materials: Brass nichel plated, Teflon insulator, 5m RG58 C/U MIL C17
 HP-AC/U

2510805.00

AVAILABLE CONNECTION



MAG ... S

Tilttable Joint Chromed or black



MAG ... PL

UHF-female connector



MAG ... 3/8

3/8" connection



"MAG 125" Magnet Mount

Frequency Range: from DC to 500 MHz. Overall size: Ø 127 mm
 Materials: Ferrite magnet, Chromed Brass, Nylon, Rubber protection
 Cable / Connector: 3.6 m RG 58 / PL 259 R male

MAG 125 PL	2502602.05
MAG 125 S	2502602.01
MAG 125 S Black	2502602.02
MAG 125 3/8	2502602.03



"MAG 160" Magnet Mount

Frequency Range: from DC to 500 MHz. Overall size: Ø 166 mm
 Materials: Chromed Brass, Nylon, Magnetic Rubber
 Cable / Connector: 3.6 m RG 58 / PL 259 R male

MAG 160 PL	2502802.05
MAG 160 S	2502802.01
MAG 160 S Black	2502802.02
MAG 160 3/8	2502802.03



"HP MAG 125 PL" Magnet Mount

Frequency Range: from DC to 500 MHz
 Overall size: Ø 127 mm
 Materials: Ferrite magnet, Chromed Brass, Nylon, Rubber protection, Teflon insulator, Gold plated pin
 Cable: 3.6m RG58 C/U MIL C17
 HP MAG 125 PL

2511202.05



"Antennas Display"

Materials: Silver painted zamak with rubber gasket
 Fixing Hole: 8 x Ø 12.5 mm
 ANTENNAS DISPLAY

2508008.00



"Antennas' Dispenser"

Overall Dimension W x H: 86 x 230 cm
 Material: Painted steel.
 Antenna's dispenser

Max weight capacity: 20 Kg

32.0002


SMA-male

Frequency: from DC to 9 GHz. Materials: Nickel plated brass, Teflon insulator, Gold plated pin.
 Crimp type for RG 58, CO 100 30.SMA001.00
 Crimp type for RG 174, RG 316 30.SMA002.00


SMA-female

Frequency: from DC to 9 GHz. Materials: Nickel plated brass, Teflon insulator, Gold plated pin.
 Crimp type for RG 58, CO 100 30.SMA003.00
 Crimp type for RG 174, RG 316 30.SMA004.00


SMA-male Reverse Polarity

Frequency: from DC to 9 GHz. Materials: Nickel plated brass, Teflon insulator, Gold plated pin.
 Crimp type for RG 58, CO 100 30.SMA005.00
 Crimp type for RG 174, RG 316 30.SMA006.00


SMA-female Panel

Frequency: from DC to 9 GHz. Materials: Nickel plated brass, Teflon insulator, Gold plated pin.
 Crimp type for RG 58, CO 100 30.SMA008.00
 Crimp type for RG 174, RG 316 30.SMA007.00


FME-male

Materials: Nickel plated brass, Teflon insulator, Gold plated central pin.
 Crimp type for RG 58, CO 100 30.FME001.00
 Crimp type for RG 174, RG 316 30.FME005.00


FME-female

Materials: Nickel plated brass, Delrin insulator, Gold plated central pin.
 Crimp type for RG 58, CO 100 30.FME002.00
 Crimp type for RG 174, RG 316 30.FME003.00


N-male

Frequency: from DC to 6 GHz. Materials: Nickel plated brass, Teflon insulator, Gold plated pin.
 Crimp type for RG 58, CO 100 30.N001.00


N-female

Frequency: from DC to 6 GHz. Materials: Nickel plated brass, Teflon insulator, Gold plated pin.
 Crimp type for RG 58, CO 100 30.N002.00


BNC-male

Frequency: from DC to 4 GHz. Materials: Nickel plated brass, Teflon insulator, Gold plated pin.
 Crimp type for RG 58, CO 100 30.BNC001.00


TNC-male

Frequency: from DC to 4 GHz. Materials: Nickel plated brass, Teflon insulator, Gold plated pin.
 Crimp type for RG 58, CO 100 30.TNC001.00


TNC-male Reverse Polarity

Frequency: from DC to 4 GHz. Materials: Nickel plated brass, Teflon insulator, Gold plated pin.
 Crimp type for RG 58, CO 100 30.TNC002.00


FME-m / UHF-m adaptor

Materials: Nickel plated brass, Delrin insulator, Gold plated central pin.
 P/N 30.AD002.00


FME-m / TNC-m adaptor

Materials: Nickel plated brass, Delrin insulator, Gold plated central pin.
 P/N 30.AD003.00


FME-m / Mini UHF-m adaptor

Materials: Nickel plated brass, Delrin insulator, Gold plated central pin.
 P/N 30.AD004.00


FME-m / BNC-m adaptor

Materials: Nickel plated brass, Delrin insulator, Gold plated central pin.
 P/N 30.AD005.00


FME-m / N-m adaptor

Materials: Nickel plated brass, Delrin insulator, Gold plated central pin.
 P/N 30.AD006.00

COAXIAL CABLES Data

Type	Impedance	External diameter	Colour
RG 58 C/U	50 Ω	4.95 mm	Black
CO 100	50 Ω	4.95 mm	White
RG 174	50 Ω	2.8 mm	Black
RG 316/U	50 Ω	2.5 mm	Brown

Attenuation dB for 100 m

Freq. Cable	25 MHz	50 MHz	100 MHz	200 MHz	300 MHz	400 MHz	500 MHz	800 MHz	1 GHz	1.6 GHz	1.8 GHz	2.0 GHz	2.2 GHz	2.4 GHz	2.5 GHz	3.0 GHz
RG 58 C/U	7	10	15	21	26	30	34	44	50	66	70	76	78	86	87	98
CO 100	5	7	10	14	17	20	23	29	33	42	45	48	50	53	54	60
RG 174	13	18	27	39	48	56	64	84	95	124	133	141	150	159	162	184
RG 316/U	12	17	26	38	47	55	62	80	91	118	126	134	141	149	152	169

Introduction to the radiation patterns coordinate and plotting.

The technical data published on this catalog have been measured by means of the last generation of sophisticated equipment to minimise doubts or mistakes on measurements. When comparing two radiation diagrams you should keep into consideration following points:

- # Check that all patterns in this catalog have been normalized (the outside of the pattern is the maximum gain of the antenna).
- # A very important point to remember it is that the shape of a pattern (its general appearance) is highly dependent on the grid system used for the plotting.
- # Our radiation polar patterns are represented in 30 dB logarithmic grid scale like most part of manufacturers. The main goal of such diagrams is to amplify the maximum gain area to better show all details.

Gain measurement methods.

The gain values for base and marine antennas are expressed in dBd (Decibel relative to 1/2 wave dipole) and they are the result of the comparison between the reference antenna, in this case the 1/2 wave dipole, and the antenna to test. Same measurement method is used for vehicular antennas but the difference is the reference antenna which is a 1/4 wave whip mounted on centre car roof. It's possible to calculate the gain value in dBi (decibel relative to Isotropic radiator) or in dBd (decibel relative to 1/2 wave dipole) by adding or deducting 2.14 to the available value. If the available value is expressed in dBd you should add 2.14 to get the equivalent in dBi (Ex: 3 dBd + 2.14 = 5.14 dBi); if the value is expressed in dBi you should deduct 2.14 to get the equivalent value in dBd (Ex: 5.14 dBi - 2.14 = 3 dBd).

Antenna radiation patterns.

An antenna radiating in space produces all around a high frequency electromagnetic field that can be considered as a 3D solid part (see fig 3-A and 3-B). The radiation diagram is the graphic representation in polar or rectangular coordinates of the function signal-angle and it is a section of the solid diagram in its two main planes: electrical plane E (it contains the radiant element) and magnetic plane H (it's perpendicular to the radiant element).

From the radiation diagram you can get quite important parameters like:

Radiation Angle, Half Power Beamwidth, side lobes level, front-to-back ratio.

Radiation angle (A): is the angular value expressed in degree (°) respect to the horizon where the maximum gain has been measured (see fig 1 and fig 2). This is a very important value for long distance connection (DX) both for the omnidirectional and directional antennas. This parameter is directly influenced by the relation between wave-length and ground height.

Half Power Beam Width (α): is the angular value expressed in degree (°) inside which the radiated power is reduced of one half (-3 dB) respect to the maximum value (see fig 1 and fig 2). The -3 dB beamwidth is related to gain. The relationship is such that when gain increases the beamwidth decreases and vice versa.

Side lobes level (B): Side lobes are spurious lobes more or less marked that normally are closed to the main lobe and waste power towards undesired directions (see fig 1 and fig 2). To get a better efficiency and higher gain of the main lobe it's necessary to reduce the side lobes to an acceptable level.

Front to back ratio or F/B ratio (C): indicated only for directional antennas like: yagi, log-periodic, horn, etc. it is the ratio of the radiated power in a maximum radiation direction to the radiated power in the opposite direction (at 180° from maximum, see fig 1).

Frequency range,Bandwidth and SWR measurement

For fixed frequency antennas the frequency range is the width inside which the SWR values are kept within specified limits (see fig 4-A). For frequency tunable antennas the frequency range is the frequency shift of resonance from the lower frequency to the high frequency, and the bandwidth is the width inside which the SWR values are kept within specified limits (see fig 4-B). In our technical data the SWR limit are from 1.5 to 2 (according to the model) and the SWR at frequency resonance is typically lower than 1.2. All our published technical data are measured at the antenna connector.

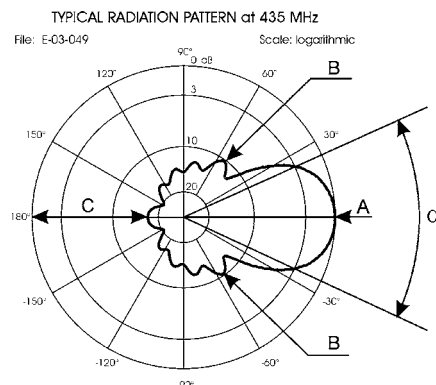


Fig 1

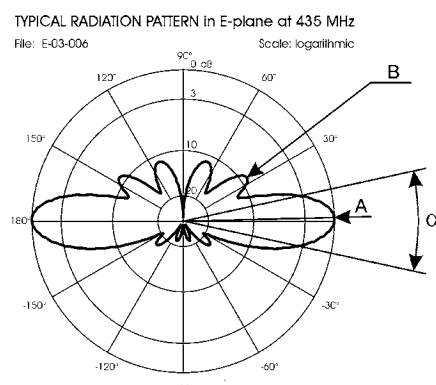


Fig 2

Yagi 3D radiation pattern

Omni 3D radiation pattern

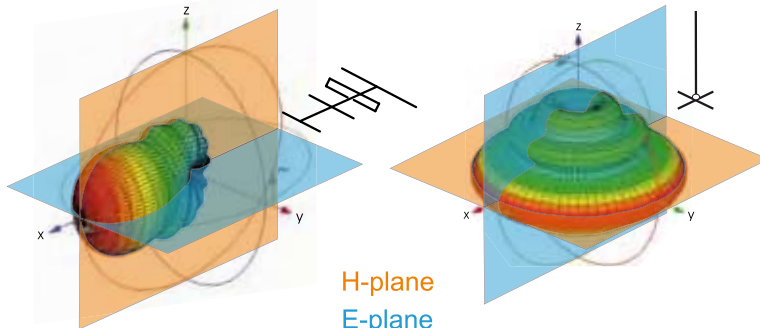
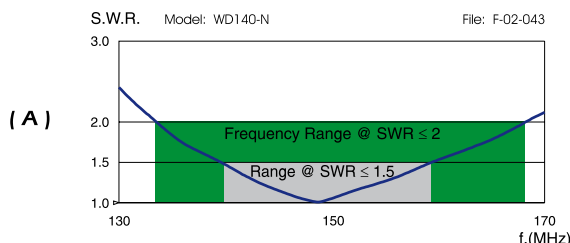


Fig 3 (A)

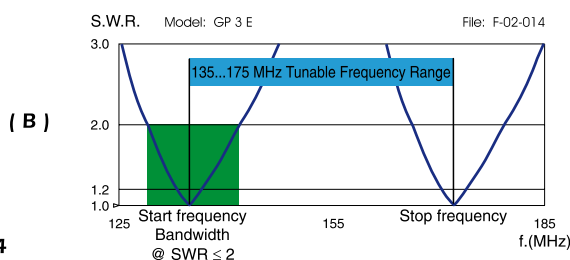
(B)

TYPICAL S.W.R. OF FIXED FREQUENCY ANTENNAS



(A)

TYPICAL S.W.R. OF TUNABLE FREQUENCY ANTENNAS



(B)

Fig 4

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