Horwin

Antenna-feeder equipment for radio communication systems

2017

Horwin

Antennas

Cavity Filters

VHF & UHF Folded Dipole Antennas

HORWIN AD series is a single or dipole array wide band VHF/UHF antennas for extensive range of applications – trunking radio systems, military communications, dispatch base stations, amateur radio repeaters, etc.
Dipole incorporates "balun" matching circuit optimized for wide bandwidth and accurate matching. More gain is achieved by coupling single folded dipoles into arrays. Dipoles in array are coupled by precision phasing cable harness keeping low SWR and minimum insertion losses.
The horizontal radiation pattern is adjusted by changing the distance between dipole elements and supporting mast.
All antenna parts are made of AD31 (T6063) aluminium and covered with black polymer powdered coating which resists water and ice buildup, and provides exceptional protection from corrosive gases, UV radiation, salt spray, acid rain and windblown abrasives.
The boom is mounted to the mast (Ø 30-55 mm) through the omega clamp with U-bolts. All components of dipole element are DC-grounded for better lighting and antistatic protection.

The phasing cable harness is fully waterproof and protected against hostile environments. Feed cable terminates with N type female connector, nominal impedance–50 Ohm.

		Horwin AD160			Horwin AD450			
AD Antenna dipole **xx** band (16 = 160, 45 = 450 MHz) **xx** number of elements		**1**	**2**	**4**	**1**	**2**	**4**	**8**
Frequency range, MHz		**136 – 176**			**400 – 470**			
Bandwidth @ SWR < 1,5, MHz		**40**			**70**			
Elements		**1**	**2**	**4**	**1**	**2**	**4**	**8**
Gain, dBd (1/4 λ dipole to mast spacing)		**0**	**3**	**6**	**0**	**3**	**6**	**9**
Gain, dBd (3/8 λ dipole to mast spacing)		**3**	**5,6**	**9**	**3**	**5,6**	**9**	**12**
Power rating, W		**200**			**200**			
Overall dimensions, mm 3/8λ spacing	H D	**900** **1100**	**2200** **1100**	**4800** **1100**	**450** **550**	**100** **550**	**2200** **550**	**4600** **550**
Weight (aprox.), kg		**2,8**	**5,9**	**11,5**	**2**	**3,2**	**7,2**	**14,5**
Impedance, Ohm		50						
Termination		**N-** female						
Vertical beamwidth (3/8 spacing)		**19°**						
Dimensions (HxD) max								
Max. exposed area, m^2		**0,29**						
Lateral thrust at 45 m/s, H		**335H**						
Lightning protection		**CD Ground**						
Rated wind velocity, m/s		**45**						
Rated wind velocity with 0.5" icing, m/s		**28**						

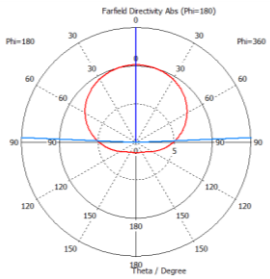
VHF Folded Dipole Antenna

HORWIN AD1604 is a 4- elements dipole array wide band VHF antenna for extensive range of applications – trunking radio systems, military communications, dispatch base stations, amateur radio repeaters, etc.
Dipole incorporates “balun” matching circuit optimized for wide bandwidth and accurate matching. More gain is achieved by coupling single folded dipoles into arrays. Dipoles in array are coupled by precision phasing cable harness keeping low SWR and minimum insertion losses.
The horizontal radiation pattern is adjusted by changing the distance between dipole elements and supporting mast.
All antenna parts are made of AD31 (T6063) aluminium and covered with polymer powdered coating (resists water and ice buildup, and provides exceptional protection from corrosive gases, UV radiation, salt spray, acid rain and windblown abrasives).
The boom is mounted to the mast (Ø 30-55 mm) through the omega clamp with U-bolts. All components of dipole element are DC-grounded for better lighting and antistatic protection.

The phasing cable harness is fully waterproof and protected against hostile environments.

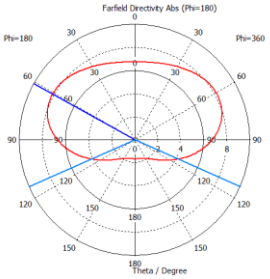
	Horwin AD 1604
Frequency range, MHz	136 – 176
Bandwidth @ SWR < 1,5, MHz	40
Elements	4
Gain, dBd (1/4 λ dipole to mast spacing)	6
Gain, dBd (3/8 λ dipole to mast spacing)	9
Power rating, W	200
Overall dimensions, mm H 3/8λ spacing D	4800 1100
Weight (aprox.), kg	11,5
Impedance, Ohm	50
Termination	N- female
Vertical beamwidth (3/8 spacing)	19°
Max. exposed area, m^2	0,29
Lateral thrust at 45 m/s, N	335
Lightning protection	DC Ground
Rated wind velocity, m/s	45
Rated wind velocity with 13mm icing, m/s	28

E-plane ¼ λ dipole to mast spacing



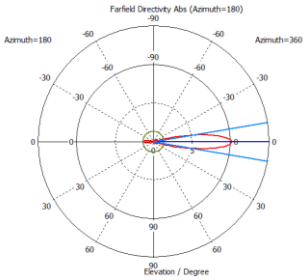
Frequency = 150
Main lobe magnitude = 11.1
Main lobe direction = 0.0 deg.
Angular width (3 dB) = 175.2 deg.

E-plane 3/8 λ dipole to mast spacing



Frequency = 150
Main lobe magnitude = 8.14
Main lobe direction = 61.0 deg.
Angular width (3 dB) = 227.6 deg.

H-plene



Frequency = 150
Main lobe magnitude = 11.1
Main lobe direction = 0.0 deg.
Angular width (3 dB) = 19.4 deg.
Side lobe level = -8.6 dB

VHF YAGI antennas with folded vibrator AY160xD

AY160xD series is a heavy duty 3 or 5 elements directional antenna with folded dipole as driven element designed for various point to point as well as point/multipoint application when wide bandwidth, mechanical strength and durability are important.

Folded driven element incorporates “balun” matching circuit optimized for wide bandwidth and accurate matching. All components of antenna are DC- grounded for better lighting and antistatic protection.

Antenna is made of AD31 (T6063) galvanized aluminium and covered with black polymer powdered coating. Boom material is 25 mm OD tube, driven element is 18 mm OD and passive elements are 8 mm OD tube. Elements are mounted to the boom with special aluminium brackets. The antenna supplied with 0,5 m long “tail” terminated with an UHF type female connector.

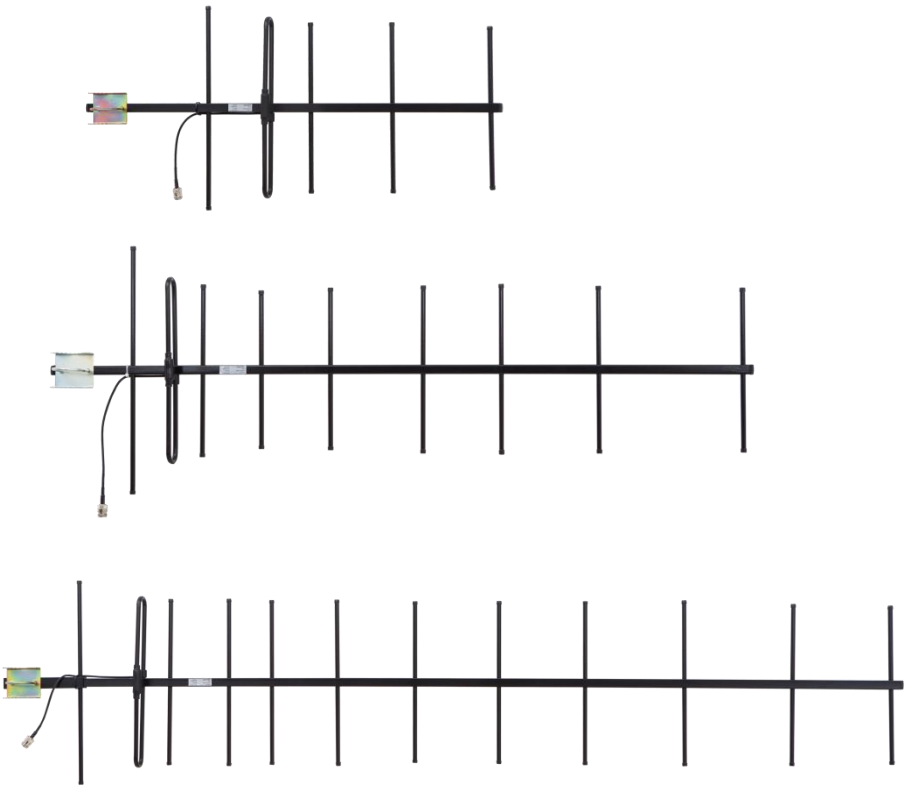
The boom is rear-mounted to the mast (Ø 30-55 mm) through the omega clamp with U-bolts for either vertical or horizontal polarization.

Antenna is shipped disassembled and is easily assembled in the field (all elements and their position on the antenna boom are clearly marked).

AY **16** **xx** **D**	“Yagi” antenna frequency band (16=160 MHz) number of elements folded dipole vibrator	**AY1603D**	**AY1605D**
Elements		**3**	**5**
Frequency range, MHz		**148 – 174**	**148 – 174**
Bandwidth, MHz		**26**	**26**
SWR		**< 1,5**	**< 1,5**
Power rating, W		**200**	**200**
Gain, dBd		**5.6**	**8**
Front to Back ratio, dB		**20**	**20**
Beamwidth (H-plane)		**105**	**48**
Beamwidth (E-plane)		**50**	**40**
Nominal impedance, Ohm		**50**	**50**
Dimensions (HxL), мм		**900 x 1000**	**900 x 1500**
Weight, kg		**1,6**	**2,0**

UHF YAGI antennas with folded vibrator AY450xD

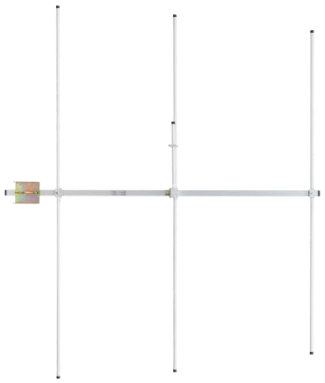
AY450xxD series is a 5, 9 or 12 elements wide bandwidth light weight directional antenna with folded dipole as driven element designed for various point to point as well as point / multipoint application.
Folded driven element incorporates “balun” matching circuit optimized for wide bandwidth and accurate matching. All components of antenna are DC- grounded for better lighting and antistatic protection.
Antenna is made of AD31 (T6063) galvanized aluminium and covered with black polymer powdered coating. Boom material is 15 by 15 mm square tube and elements are made of 8 mm OD tube. Elements are mounted through the boom and fixed with self tapping screws. The antenna is supplied with 0,2 m long “tail” terminated with an N type female connector.
AY450xD includes mounting hardware — a U-bolt and special mounting bracket for rear mounting to the mast (30–40mm OD) for either vertical or horizontal polarization.
Antenna is shipped fully assembled, central bandwidth frequency must be specified in customer’s order.

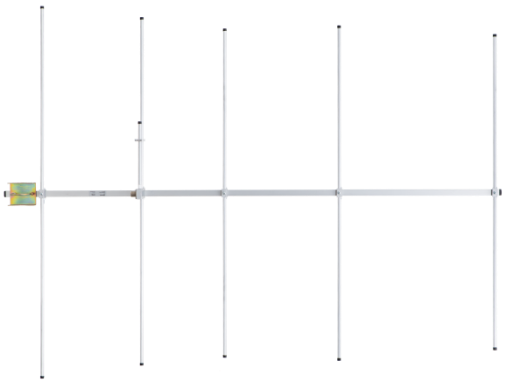


AY “Yagi” antenna **45** frequency band (45=450 MHz) **xx** number of elements **D** folded dipole vibrator	**AY4505D**	**AY4509D**	**AY45012D**
Elements	**5**	**9**	**12**
Frequency range, MHz	**403 – 470**	**403 – 470**	**403 – 470**
Bandwidth, MHz	**50**	**50**	**50**
SWR	**< 1,5**	**< 1,5**	**< 1,5**
Power rating, W	**100**	**100**	**100**
Gain, dBd	**5,6**	**10**	**12**
Front to Back ratio, dB	**22**	**22**	**20**
Beamwidth (H-plane)	**48**	**40**	**36**
Beamwidth (E-plane)			
Nominal impedance, Ohm	**50**	**50**	**50**
Dimensions (HxL), мм	**395 x 700**	**395 x 1080**	**395 x 1500**
Weight, kg	**0,55**	**0,65**	**1,05**

VHF Yagi antennas AY160x

AY160x series is an inexpensive lightweight 3 or 5 elements directional antenna with “straight” driven element and “gamma matching” designed for various point to point as well as point/multipoint applications, such as rural telecommunications, repeater operations, telemetry SCADA links, etc.
Antenna is made of AD31 (T6063) galvanized aluminium. Boom material is 15 by 15 mm square tube and elements are 8 mm OD tube. Elements are mounted to the boom by special aluminium brackets through the boom with 6mm hex bolts. Feed line connector is UHF female panel mount type mounted on driven element.
AY160x includes mounting hardware — a U-bolt and special mounting bracket for rear mounting to the mast (30–40mm OD) for either vertical or horizontal polarization. Antenna is shipped disassembled and is easily assembled in the field (all elements and their position on the antenna boom are clearly marked).
Antenna is tuned to central frequency of customer specified range (< 8 MHz) or specified frequency.





AY Yagi antenna **16** band (16=160 MHz) **xx** number of elements	**AY1603**	**AY1605**
Elements	**3**	**5**
Frequency range, MHz	**144 – 174**	**144 – 174**
Bandwidth, MHz	**8**	**8**
SWR	**< 1,5**	**< 1,5**
Power rating, W	**100**	**100**
Gain, dB	**5,6**	**8**
Front to Back ratio, dB	**20**	**20**
Beamwidth (H-plane)	**105°**	**48°**
Beamwidth (E-plane)	**50°**	**40°**
Nominal impedance, Ohm	**50**	**50**
Dimensions (H x L), mm	**900 x 1000**	**900 x 1500**
Weight, kg	**0,65**	**0,85**

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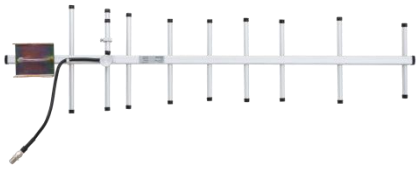
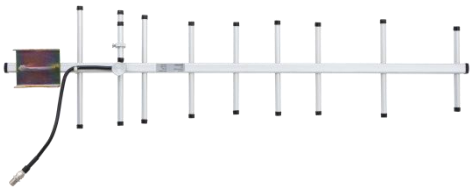
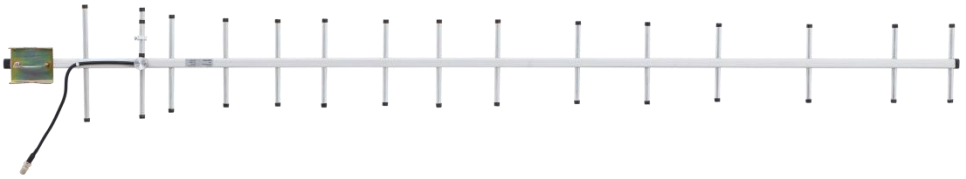
AY800 & AY900
Yagi Antennas for Cellular 800/900 MHz Band

AY800/900xx series is lightweight 6, 9, 12 or 15 elements directional YAGI antenna which uses "gamma matching" technique for matching the input impedance of the antenna to 50 Ohm feeding line.
It is a low cost signal enhancement solution for fixed wireless phones, data terminals, cellular network repeaters and rural telephony applications used within 800 or 900 MHz cellular band.
Antenna is made of AD31 (T6063) galvanized aluminium. Boom material is 15 by 15 mm square tube and elements are 8 mm OD tube. Elements are mounted through the boom and fixed with self tapping screws. Antenna is supplied with 0,3 m long "tail" terminated with an F type female connector.
Antenna is shipped fully assembled and includes mounting hardware – a U-bolt and special mounting bracket for rear mounting to the mast (30–40mm OD) for either vertical or horizontal polarization.
Antenna is fully weatherproof and well suited to either domestic or commercial applications.







AY Yagi antenna **xx** band (80=800, 90=900 MHz) **xx** number of elements	**AY8006** **AY9006**	**AY8009** **AY9009**	**AY80012** **AY90012**	**AY80015** **AY90015**
Elements	**6**	**9**	**12**	**15**
Frequency range, MHz	**824 – 894** **880 – 970**	**824 – 894** **880 – 970**	**824 – 894** **880 – 970**	**824 – 894** **880 – 970**
Bandwidth, MHz	**70** **90**	**70** **90**	**70** **90**	**70** **90**
SWR	**< 1,5**	**< 1,5**	**< 1,5**	**< 1,5**
Power rating, W	**100**	**100**	**100**	**100**
Gain, dB	**8**	**10**	**12**	**13,5**
Front to Back ratio, dB	**25**	**25**	**20**	**18**
Beamwidth (H-plane)	**60**	**40**	**36**	**28**
Beamwidth (E-plane)	**42**	**50**	**38**	**32**
Nominal impedance, Ohm	**50**	**50**	**50**	**50**
Dimensions (H x L), mm	**500 x 180**	**665 x 180**	**1000 x 180**	**1500 x 180**
Weight, kg	**0,3**	**0,4**	**0,5**	**0,6**

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VHF Rail/Transit Antenna

AR160 is a folded quarter wave vertical antenna mostly used for VHF cab radios on rail and transit lines shunt locomotives. There are two version of antenna design: “standard” and half-heighted – “low profile”. These rugged steel-made antennas are also an excellent solution to prevent vandalism destructions in high-risk areas and a good alternative to whip antennas on tall vehicles frequently exposed to damaging automatic washes. “Low profile” version is a good alternative to whip antennas on tall vehicles, that are destroyed when entering parking ramps, garages, etc.

Antenna is made of steel and is covered with black polymer powdered coating. The cable connection point is fully waterproof and protected against hostile environments. The feed “tail” is 0,3 meter long RG213 cable terminating with UHF type female connector.

Antenna has mounting plate for installation on vehicle rooftop with 4 bolts (or welded to locomotive). Additional mounting hole for cable tail required.

Antenna is tuned to central frequency of customer specified range (< 10 MHz).

	AR160	AR160L
AR «railroad» antenna **xxx** band, MHz **L** «low profile» version	**Railroad VHF Antenna**	**Low Profile Railroad VHF Antenna**
Overall dimensions (H x L x D), мм	**450 x 200 x 100**	**240 x 200 x 315**
Frequency range, MHz	**148 – 174**	
Bandwidth, MHz	**10**	
SWR	**< 1,5**	
Nominal impedance, Ohms	**50**	
Power rating, W	**200**	
Weight, kg	**3,2**	
Max wind speed, m/s	**< 120**	

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800 MHz MIMO Rooftop Antenna

AR800M is a “non-compromising design” high gain omnidirectional MIMO rooftop antenna primarily designed for 3G/4G applications such as on-board internet, video surveillance (CCTV) and other systems requiring high data rate mobile connection for using on high speed trains, trams, buses and other public transportation services.

Antenna incorporates array of two 2x(2x2) radiating elements with double linear polarization. All antenna components are DC grounded to protect against lightning and high-tension lines.

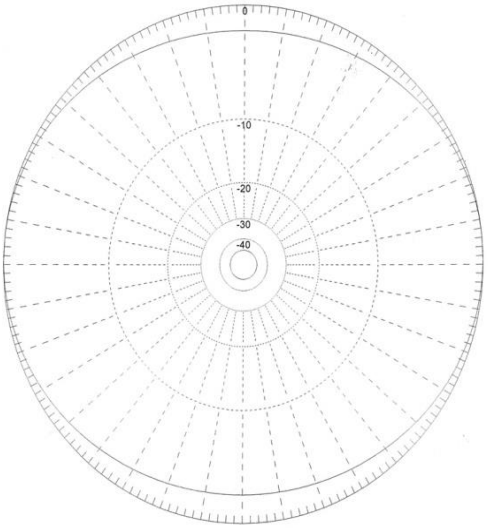
Antenna is housed in flame retardant ABS plastic housing, fully waterproof and protected against hostile environments (rating to satisfy IP67 requirements). Antenna has mounting plate for installation on rooftop with 4 bolts.

AR **«railroad» antenna**
xxx **band, MHz**
M **MIMO**

AR800M

Polarisation	**± 45º**
Frequency range	**824 – 894 MHz**
Bandwidth	**70 MHz**
SWR	**< 1,5**
Power rating	**50 W**
Nominal impedance	**50 Ohms**
Gain, dBi	**2 x 5,5**
“H plane” radiation beamwidth	**60º**
Overall dimensions (H x L x D)	**255 x 245 x 100 мм**
Weight	**2,5 kg**
Max wind speeded	**< 120 м/s**

“E plane” radiation plot



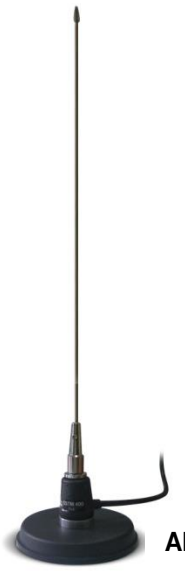
VHF & UHF Vehicle Magnetic Mount Whip Antennas

AM is a series of VHF & UHF vehicle whip antennas with compact magnetic mount. These antennas are effective for applications where a quick set and removal of the antenna is required or where a permanent installation is not possible. Antenna type is a vertical $^{1}/_{4}$ λ (VHF & UHF) or $^{5}/_{8}$ λ (UHF only) monopole that requires ground plane (vehicle roof or any metal surface) for effective operation.

Compact magnetic mount for easy-to-setup temporary installation is 95 mm OD and incorporates 83 mm magnet. Whip is made of 2 mm stainless steel. Bottom of the magnet mount is covered by rubber for preventing vehicle surface from scratching.

Antenna is supplied with 4,5 meter long RG58U coax 'tail'. Type of connector is to be specified by customer.

Each antenna is supplied with a whip ready for use at the lowest frequency. Tuning to desired frequency made by bottom of the whip cutting.



AM100 (1/4)

AM400 (5/8)

AM400 (1/4)

AM800 (5/8)

	AM100 (1/4)	AM400 (1/4)	AM400 (5/8)	AM800 (5/8)
AM xxx (x/x) Magnetic mount antenna band (100 = VHF, 400 = UHF,) monopole length (wavelength)	**VHF $^{1}/_{4}$ λ Whip**	**UHF $^{1}/_{4}$ λ Whip**	**UHF $^{5}/_{8}$ λ Whip**	**800/900 MHz $^{5}/_{8}$ λ Whip**
Frequency range, MHz	**136 – 174**	**400 – 470**	**400 – 470**	**825 – 895**
SWR (@ central frequency)	**< 1,5**	**< 1,5**	**< 1,5**	**< 1,5**
Bandwidth @ SWR < 1,5	**15**	**40**	**20**	**70**
Power rating, W	**100**	**100**	**100**	**50**
Gain, dBd	**0**	**0**	**3**	**3**
Coax line length, м	**4,5**	**4,5**	**4,5**	**4,5**
Types of connectors	**UHF, N, BNC**	**UHF, N, BNC**	**UHF, N, BNC**	**TNC, SMA**
Antenna height, мм	**570**	**250**	**500**	**300**
Weight, kg	**0,5**	**0,4**	**0,5**	**0,5**

COMPACT VHF/UHF PASS – REJECT FILTERS

Horwin PRF-V/UM6-x series is a compact "band pass – band reject" filters based on a 6 full size quarter wavelength resonator on UHF and helically on VHF. This filter types can be used to protect a receiver against interference from a nearby transmitter. Pass/reject filters are irreplaceable when the spacing between RX frequency and the interfering signal so small, that the slop of normal pass filters or reject filters are not sufficient to provide adequate rejections.

The filter's cavities are made of extruded aluminium. All coaxial cables used are semi-rigid silver plated. Cables and connectors are with PTFE insulation. Filters are covered with black polymer powdered coating.

Filters are tuned for customer specified pass/reject frequencies and no further adjustments should be required.

	PRF-VM6-SL	PRF-UM6-L
PRF Pass-Reject Filter **x** frequency range (V=VHF, U=UHF) **M6** mobile type, 6 cavities **S** helically resonator **x** input power (L=50W)	**low power compact with helically resonators**	**low power compact with full size quarter-wavelength resonators**
Cavity size, mm	**23 x 23**	**23 x 23**
Frequency range, MHz (exact frequencies should be specified when ordering)	**144 – 174**	**400 – 470**
Duplex frequency spacing, MHz	**3 – 15**	**10**
Max. continuous power input, W	**50**	**50**
Insertion loss, db	**< 2.5**	**< 2.5**
Reject attenuation, dB	**> 80**	**> 85**
Nominal impedance, Ohm	**50**	**50**
VSWR	**< 1.5**	**< 1.5**
Connectors type	**N-female**	**N-female**
Temperature range, °C	**–30 … +60**	**–30 … +60**
Dimensions (H x W x L), mm (length may vary depending on frequencies ordered)	**30 x 155 x 220**	**30 x 115 x 250**
Weight, kg	**1**	**1**

VHF/UHF PASS-REJECT FILTERS with 5" & 8" Cavities

Horwin PRF-V/Ux-x series is a "band pass – band reject" filters based on a quarter wave 5 or 8 inches width square cavities. The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass or reject spacing.

There are single or dual cavity filters available. More cavities provide greater selectivity and, when required, a wider pass-band. Filter nominal impedance is 50 Ohms. N-type "female" connectors are used for input/output connections.

Cavities are aluminium made with 5 mm thick top plate welded to the cavity body. Inner conductor and coupling loops are silver plated cooper made. Central tuning road is invar made. All this provides excellent frequency stability in temperature range from - 30 to + 60°C.

Filters are tuned for customer's specified frequencies and no further adjustments should be required. If frequency changes become necessary cavity pass frequency may be adjusted by tuning road and reject frequency by adjustable coupling loop and tuning capacitor.

		PRF-Vx-5		PRF-Vx-8		PRF-Ux-5		PRF-Ux-8	
PRF Pass–Reject Filter **x** frequency range (V=VHF, U=UHF) **x** cavities numbers **x** cavity width (inches)		**VHF pass-reject filter 5" cavities**		**VHF pass-reject filter 8" cavities**		**UHF pass-reject filter 5" cavities**		**UHF pass-reject filter 8" cavities**	
Cavity size		**1/4λ, 5"**		**1/4λ, 8"**		**1/4λ, 5"**		**1/4λ, 8"**	
Frequency range, MHz		**144 – 174**		**144 – 174**		**400 – 470**		**400 – 470**	
Max. continuous power input, W		**200**		**200**		**200**		**200**	
Cavities numbers		**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
Insertion losses, dB		**0.5**	**1**	**0.5**	**1**	**0.5**	**1**	**0.5**	**1**
ATT, dB @ notch frequency		**17**	**45**	**19**	**50**	**20**	**47**	**22**	**55**
Dimensions, mm (with tuning rod extended)	H D W	**880** **130** **130**	**880** **130** **260**	**880** **210** **210**	**880** **210** **420**	**400** **130** **130**	**400** **130** **260**	**400** **210** **210**	**400** **210** **420**
Weight, kg		**2.7**	**5.5**	**3.5**	**7.1**	**1.5**	**3.1**	**2**	**4.1**

VHF/UHF REJECT FILTERS with 5” & 8” Cavities

Horwin RF-V/Ux-x series is a reject (notch) filters based on a quarter wave 5 or 8 inches width square cavities. The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass or reject spacing.

There are single or dual cavity filters available. More cavities provide greater rejecting, when required, a wider notch. Filter nominal impedance is 50 Ohms. N-type “female” connectors are used for input/output connections.

Cavities are aluminium made with 5 mm thick top plate welded to the cavity body. Inner conductor and coupling loops are silver plated cooper made. Central tuning road is invar made. All this provides excellent frequency stability in temperature range from – 30 to + 60°C

Filters are tuned for customer specified frequencies and no further adjustments should be required.

		RF-Vx-5		RF-Vx-8		RF-Ux-5		RF-Ux-8	
RF Reject Filter **x** frequency range (V=VHF, U=UHF) **x** cavities numbers **x** cavity width (inches)		**VHF notch filter 5” cavities**		**VHF notch filter 8” cavities**		**UHF notch filter 5” cavities**		**UHF notch filter 8” cavities**	
Cavity size		**1/4λ, 5”**		**1/4λ, 8”**		**1/4λ, 5”**		**1/4λ, 8”**	
Frequency range, MHz		**144 – 174**		**144 – 174**		**400 – 470**		**400 – 470**	
Max. continuous power input, W		**200**		**200**		**200**		**200**	
Cavities numbers		**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
ATT, dB @ notch frequency		**17**	**45**	**19**	**50**	**20**	**47**	**22**	**55**
Dimensions, mm (with tuning rod extended)	H	**880**	**880**	**880**	**880**	**400**	**400**	**400**	**400**
	W	**130**	**130**	**210**	**210**	**130**	**130**	**210**	**210**
	L	**130**	**260**	**210**	**420**	**130**	**260**	**210**	**420**
Weight, kg		**2.7**	**5.5**	**3.5**	**7.1**	**1.5**	**3.1**	**2**	**4.1**

VHF/UHF REJECT FILTERS with 5” & 8” Cavities

Horwin RF-V/Ux-x series is a reject (notch) filters based on a quarter wave 5 or 8 inches width square cavities. The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass or reject spacing.

There are single or dual cavity filters available. More cavities provide greater rejecting, when required, a wider notch. Filter nominal impedance is 50 Ohms. N-type “female” connectors are used for input/output connections.

Cavities are aluminium made with 5 mm thick top plate welded to the cavity body. Inner conductor and coupling loops are silver plated cooper made. Central tuning road is invar made. All this provides excellent frequency stability in temperature range from – 30 to + 60°C

Filters are tuned for customer specified frequencies and no further adjustments should be required.

		RF-Vx-5		RF-Vx-8		RF-Ux-5		RF-Ux-8	
RF Reject Filter **x** frequency range (V=VHF, U=UHF) **x** cavities numbers **x** cavity width (inches)		**VHF notch filter 5” cavities**		**VHF notch filter 8” cavities**		**UHF notch filter 5” cavities**		**UHF notch filter 8” cavities**	
Cavity size		**1/4λ, 5”**		**1/4λ, 8”**		**1/4λ, 5”**		**1/4λ, 8”**	
Frequency range, MHz		**144 – 174**		**144 – 174**		**400 – 470**		**400 – 470**	
Max. continuous power input, W		**200**		**200**		**200**		**200**	
Cavities numbers		**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
ATT, dB @ notch frequency		**17**	**45**	**19**	**50**	**20**	**47**	**22**	**55**
Dimensions, mm (with tuning rod extended)	H	**880**	**880**	**880**	**880**	**400**	**400**	**400**	**400**
	W	**130**	**130**	**210**	**210**	**130**	**130**	**210**	**210**
	L	**130**	**260**	**210**	**420**	**130**	**260**	**210**	**420**
Weight, kg		**2.7**	**5.5**	**3.5**	**7.1**	**1.5**	**3.1**	**2**	**4.1**

VHF/UHF BAND PASS FILTERS with 5" & 8" Cavities

Horwin PRF-V/Ux-x series is a "band pass" filters based on a quarter length 5 or 8 inches width square cavities. The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass band.

There are one, two or three cavities filters available. More cavities provide greater selectivity and, when required, a wider pass-band. Filter nominal impedance is 50 Ohms. N-type "female" connectors are used for input/output connections.

Cavities are aluminium made with 5 mm thick top plate welded to the cavity body. Inner conductor and coupling loops are silver plated cooper made. Central tuning road is invar made. All this provide excellent frequency stability in temperature range from – 30 to + 60 C°.

Filters are tuned for customer specified frequencies and no future adjustments should be required. If frequencies changes became necessary cavity pass frequency may be adjusted by tuned road and pass width by adjustable coupling loops.

PF-U2-8

PF-V3-8

		PF-Vx-5			PF-Vx-8			PF-Ux-5			PF-Ux-8		
PF Pass Filter **x** frequency range (V=VHF, U=UHF) **x** cavities numbers **x** cavity width (inches)		**VHF band pass filter 5" cavities**			**VHF band pass filter 8" cavities**			**UHF band pass filter 5" cavities**			**UHF band pass filter 8" cavities**		
Cavity size		1/4λ, 5"			1/4λ, 8"			1/4λ, 5"			1/4λ, 8"		
Frequency range, MHz		144 – 174			144 – 174			400 – 470			400 – 470		
Max. continuous power input, W		200			200			200			200		
Cavities numbers		1	2	3	1	2	3	1	2	3	1	2	3
ATT, dB/offset, Mhz													
(0.5 dB insertion losses on central F)		-20/3	–	–	-20/2	–	–	-15/4	–	–	-15/2	–	–
(2.0 dB insertion losses on central F)		-40/3	-50/2	-50/1	-35/2	-55/2	-65/2	-25/4	-45/4	-60/4	-28/2	-45/2	-60/2
(2.5 dB insertion losses on central F)		–	-60/2	-55/1	–	-65/2	-75/2	–	-55/4	-80/4	–	-50/2	-75/2
Dimensions, mm (with tuning rod extended)	H	850	850	850	850	850	850	400	400	400	400	400	400
	W	130	130	130	210	210	210	130	130	130	210	210	210
	L	130	260	390	210	420	630	130	260	390	210	420	630
Weight, kg		2.7	5.5	8.3	3.5	7.1	10.7	1.5	3.1	4.7	3.0	4.1	6.2

VHF & UHF Base Station Duplexers

Horwin DF-V/UM6-x series is compact 6 cavity base station duplex filters. “Band pass/reject” duplexer is ideal for repeaters, duplex base stations and other applications when combining of both receive and transmit frequencies into a single antenna is needed.

The high Q’s of the filter enable the duplexer to work with narrow duplex spacing and to keep low insertion losses. There are two model versions regarding power handling capability – low power up to 50 Watts continuously and high – up to 150 Watts.

The filter’s cavities are made of extruded aluminium. All coaxial cables used are semi-rigid silver plated. Cables and connectors are with PTFE insulation. Filters are covered with black polymer powdered coating.

Each filter is individually made and tuned, so receive and transmit frequencies should be specified when ordering.

DF-VM6-H

DF-VM6-SL

DF-UM6-H

DF-UM6-L

	DF-VM6-H	DF-VM6-SL	DF-UM6-H	DF-UM6-L
DF duplex filter **x** frequency range (V=VHF, U=UHF) **M6** “mobile” type, 6 cavities **S** helically resonator **x** input power (L=50W, H=150)	**high power with full quarter-wavelength resonators**	**low power compact with helically resonators**	**high power with full quarter-wavelength resonators**	**low power compact with full quarter-wavelength resonators**
Cavity size, mm	**40 x 40**	**23 x 23**	**40 x 40**	**23 x 23**
Frequency range, MHz	**144 – 174**	**144 – 174**	**400 – 470**	**400 – 470**
Duplex frequency spacing, MHz	**4 – 15**	**4 – 24**	**4 – 15**	**4 – 15**
Max. continuous power input, W	**150**	**50**	**150**	**50**
Insertion loss, db	**< 1.4**	**< 1.4**	**< 1.4**	**< 1.4**
Tx noise suppression on Rx frequency, dB	**> 80**	**> 80**	**> 85**	**> 85**
Rx isolation on Tx frequency, dB	**> 80**	**> 80**	**> 85**	**> 85**
Tx noise suppression on Rx (multichannel), dB	**> 60 (1.5 MHz BW)**	**> 60 (1.5 MHz BW)**	**> 80 (2 MHz BW)**	**> 80 (2 MHz BW)**
Rx isolation on Tx (multichannel), dB	**> 60 (1.5 MHz BW)**	**> 60 (1.5 MHz BW)**	**> 80 (2 MHz BW)**	**> 80 (2 MHz BW)**
Nominal impedance, Ohm	**50**	**50**	**50**	**50**
VSWR	**< 1.5**	**< 1.5**	**< 1.5**	**< 1.5**
Connectors type	**N-female**	**N-female**	**N-female**	**N-female**
Temperature range, °C	**–30 … +60**	**–30 … +60**	**–30 … +60**	**–30 … +60**
Dimensions (H x W x L), mm (length may vary depending on frequencies ordered)	**55 x 252 x 630**	**30 x 155 x 220**	**55 x 252 x 274**	**30 x 155 x 250**
Weight, kg	**5**	**1**	**2.5**	**1**

UHF Base Station Duplexer DF-UM6-H

Horwin DF-UM6-H is compact 6 cavity base station duplex filter. “Band pass/reject” duplexer is ideal for repeaters, duplex base stations and other applications when combining of both receive and transmit frequencies into a single antenna is needed.

The high Q’s of the filter enable the duplexer to work with narrow duplex spacing and to keep low insertion losses.

The filter’s cavities are made of extruded aluminium. All coaxial cables used are semi-rigid silver plated. Cables and connectors are with PTFE insulation. Filters are covered with black polymer powdered coating.

Each filter is individually made and tuned, so receive and transmit frequencies should be specified when ordering.

	HORWIN DF-UM6-H
Cavity size, mm	**40 x 40**
Frequency range, MHz	**400 – 470**
Duplex frequency spacing, MHz	**4 – 15**
Max. continuous power input, W	**150**
Insertion loss, db	**< 1.4**
Tx noise suppression on Rx frequency, dB	**> 85**
Rx isolation on Tx frequency, dB	**> 85**
Tx noise suppression on Rx (multichannel), dB	**> 80 (2 MHz BW)**
Rx isolation on Tx (multichannel), dB	**> 80 (2 MHz BW)**
Nominal impedance, Ohm	**50**
VSWR	**< 1.5**
Connectors type	**N-female**
Temperature range, °C	**–30 … +60**
Dimensions (H x W x L), mm (length may vary depending on frequencies ordered)	**55 x 252 x 274**
Weight, kg	**2.5**

Horwin

VHF/UHF 5” Cavity Base Station Duplexers

Horwin DF-V/U-x-5 series is a “Band pass/reject” type duplex filters based on quarter wave 5 inches width square cavities. Duplexer allows simultaneous operation of transmitter and receiver into a single antenna. Using large 5“ cavities means very high Q, resulting in very close frequency spacing and low insertion losses.

Cavities are aluminium made with 5 mm thick top plate welded to the cavity body. Inner conductor and coupling loops are silver plated cooper made. Central tuning road is invar made. All this provides excellent frequency stability in temperature range from – 30 to + 60°C.

Each filter is individually made and tuned, so receive and transmit frequencies should be specified when ordering.

	DF-V4-5	DF-V6-5	DF-U4-5	DF-U6-5
DF duplex filter **x** frequency range (V=VHF, U=UHF) **x** cavities numbers **x** cavity width (inches)	**4 cavities VHF duplex filter**	**6 cavities VHF duplex filter**	**4 cavities UHF duplex filter**	**6 cavities UHF duplex filter**
Cavity size	**1/4λ, 5”**	**1/4λ, 5”**	**1/4λ, 5”**	**1/4λ, 5”**
Frequency range, MHz	**144 – 174**	**144 – 174**	**400 – 470**	**400 – 470**
Min. duplex frequency spacing, kHz	**600**	**400**	**2000**	**1500**
Max. continuous power input, W	**150**	**150**	**150**	**150**
Insertion loss, db	**< 1.5**	**< 2**	**< 1.5**	**< 2**
Tx noise suppression on Rx frequency, dB	**> 75**	**> 85**	**> 75**	**> 85**
Rx isolation on Tx frequency, dB	**> 80**	**> 80**	**> 85**	**> 85**
Nominal impedance, Ohm	**50**	**50**	**50**	**50**
VSWR	**< 1.5**	**< 1.5**	**< 1.5**	**< 1.5**
Connectors type	**N-female**	**N-female**	**N-female**	**N-female**
Temperature range, °C	**–30 … +60**	**–30 … +60**	**–30 … +60**	**–30 … +60**
Dimensions (HxWxD), mm (with rod extended)	**880x260x260**	**880x390x260**	**400x260x260**	**400x390x260**
Weight, kg	**9.5**	**13.5**	**6.5**	**8.8**

VHF/UHF Hybrid Transmitter Combiners

Horwin CH-V/Ux-x series is a hybrid combiners with ferrite isolators used for combining several VHF/UHF transmitters into one antenna with close frequency spacing. Combiners are configured in sets of 2 or 4 channels.

There are two model versions – single or dual ferrite isolators depending on the required Tx – Tx isolation and (or) low/high power. Nominal impedance is 50 Ohms. N-type "female" connectors are used for input/output connections. Combiners are mounted on standard EIA 19" panel 3 U high and 355 mm depth.

Combiners are tuned at customer specified frequencies, so transmit frequencies should be specified when ordering.

	CH-V2-1L(H)	CH-V2-2L(H)	CH-V4-1L(H)	CH-V4-2L(H)
CH Combiner (hybrid) **x** frequency range (V=VHF) **x** Tx Channels **x** isolator type (1=single, 2=dual) **x** input power (L=50W, H=100W)	**2 channels VHF hybrid combiner with single isolator**	**2 channels VHF hybrid combiner with dual isolator**	**4 channels VHF hybrid combiner with single isolator**	**4 channels VHF hybrid combiner with dual isolator**
Frequency range, MHz	**144 – 174**	**144 – 174**	**144 – 174**	**144 – 174**
Max input power, W	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**
Isolator	**single**	**dual**	**single**	**dual**
Isolation Tx – Tx, dB	**>60**	**>80**	**>60**	**>80**
Insertion losses Tx – Ant, dB	**<4**	**<4.5**	**<7.5**	**<8**
SWR	**<1,3**	**<1,3**	**<1,3**	**<1,3**
Weight, kg	**5,4**	**5,5**	**6,4**	**6,5**

	CH-U2-1L(H)	CH-U2-2L(H)	CH-U4-1L(H)	CH-U4-2L(H)
CH Combiner (hybrid) **x** frequency range (U=UHF) **x** Tx Channels **x** isolator type (1=single, 2=dual) **x** input power (L=50W, H=100W)	**2 channels UHF hybrid combiner with single isolator**	**2 channels UHF hybrid combiner with dual isolator**	**4 channels UHF hybrid combiner with single isolator**	**4 channels UHF hybrid combiner with dual isolator**
Frequency range, MHz	**400 – 470**	**400 – 470**	**400 – 470**	**400 – 470**
Max input power, W	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**
Isolator	**single**	**dual**	**single**	**dual**
Isolation Tx – Tx, dB	**>60**	**>80**	**>60**	**>80**
Insertion losses Tx – Ant, dB	**<4**	**<4.5**	**<7.5**	**<8**
SWR	**<1,3**	**<1,3**	**<1,3**	**<1,3**
Weight, kg	**5,4**	**5,5**	**6,4**	**6,5**

Horwin

VHF/UHF 8” Cavity Transmitter Combiners

Horwin CB8-V/Ux-x series is low insertion loss combiners with ferrite isolators used for combining several transmitters into one antenna with up to 125 kHz (VHF) and 200 kHz (UHF) frequency spacing. Combiners are configured in sets of 2, 3 or 4 channels.

There are two model versions – single or dual ferrite isolators depending on the required Tx–Tx isolation. Nominal impedance is 50 Ohms with typical input SWR <1.5.

Mounting option is specified by customer (e.g. “free standing”, vertically or horizontally into EIA 19” etc). N-type “female” connectors are used for input/output connections.

Combiners are tuned at customer specified frequencies, so transmit frequencies should be specified when ordering.

	CB8-V2-1	CB8-V2-2	CB8-V3-1	CB8-V3-2	CB8-V4-1	CB8-V4-2
CB8 8” Cavity Combiner **x** frequency range (V=VHF) **x** Tx Channels **x** isolator type (1=single, 2=dual)	**2 channels VHF combiner**	**2 channels VHF combiner**	**3 channels VHF combiner**	**3 channels VHF combiner**	**4 channels VHF combiner**	**4 channels VHF combiner**
Isolator	**single**	**dual**	**single**	**dual**	**single**	**dual**
Frequency range, MHz	**144 – 174**	**144 – 174**	**144 – 174**	**144 – 174**	**144 – 174**	**144 – 174**
Max. input power, W	**50**	**50**	**50**	**50**	**50**	**50**
Spacing Tx–Tx, kHz	**>125**	**>125**	**>125**	**>125**	**>125**	**>125**
Isolation Tx–Tx, dB	**>60**	**>80**	**>60**	**>80**	**>60**	**>80**
Insertion losses, dB @ Tx–Tx spacing kHz	**2,2@150**	**2,2@150**	**2,7@150**	**2,7@150**	**3,2@150**	**3,2@150**
Dimensions (H-W-D, aprox.), mm	**850x420x210**	**850x420x210**	**850x630x210**	**850x630x210**	**850x420x420**	**850x420x420**
Weight, kg	**7,8**	**8,5**	**11,5**	**12,2**	**16,1**	**17**

	CB8-U2-1	CB8-U2-2	CB8-U3-1	CB8-U3-2	CB8-U4-1	CB8-U4-2
CB8 8” Cavity Combiner **x** frequency range (U=UHF) **x** Tx Channels **x** isolator type (1=single, 2=dual)	**2 channels UHF combiner**	**2 channels UHF combiner**	**3 channels UHF combiner**	**3 channels UHF combiner**	**4 channels UHF combiner**	**4 channels UHF combiner**
Isolator	**single**	**dual**	**single**	**dual**	**single**	**dual**
Frequency range, MHz	**400 – 470**	**400 – 470**	**400 – 470**	**400 – 470**	**400 – 470**	**400 – 470**
Max. input power, W	**50**	**50**	**50**	**50**	**50**	**50**
Spacing Tx–Tx, kHz	**>200**	**>200**	**>200**	**>200**	**>200**	**>200**
Isolation Tx–Tx, dB	**>60**	**>80**	**>60**	**>80**	**>60**	**>80**
Insertion losses, dB @ Tx–Tx spacing kHz	**2,3@450**	**2,3@450**	**2,8@450**	**2,8@450**	**3,3@450**	**3,3@450**
Dimensions (H-W-D, aprox.), mm	**400x420x210**	**400x420x210**	**400x630x210**	**400x630x210**	**400x420x420**	**400x420x420**
Weight, kg	**5**	**5,7**	**7.2**	**8**	**13**	**14**

VHF/UHF Ferrite Isolators

Horwin FI-V/Ux-x series is a ferrite isolators used for protection and isolation of VHF/UHF transmitters. There are two major benefits of isolator application: to prevent transmitter failure due to the high SWR and to prevent intermodulation caused by the nearby strong transmitting signal (signals).

There are two models with single or dual ferrite isolators and low/high power versions. Isolator nominal impedance is 50 Ohms. N-type “female” connectors are used for input/output connections.

Ferrite isolator modules are mounted into aluminium housing with radiator. Loading element is non removable. The isolators have black polymer powdered coating.

Isolators are tuned at customer specified frequency because no further tuning is possible, so transmit frequency should be specified when ordering.

	FI-V1-L	FI-V2-L	FI-V1-H	FI-V2-H
FI ferrite isolator **x** frequency range (V=VHF) **x** isolator type (1=single, 2=dual) **x** input power (L=50W, H=100W)	**VHF low power single ferrite isolator**	**VHF low power dual ferrite isolator**	**VHF high power single ferrite isolator**	**VHF high power dual ferrite isolator**
Frequency range, MHz	**144 – 174**	**144 – 174**	**144 – 174**	**144 – 174**
Max input power, W	**50**	**50**	**100**	**100**
Isolation, dB	**> 30**	**> 60**	**> 30**	**> 60**
Insertion losses, dB	**< 0,4**	**< 0,8**	**< 0,4**	**< 0,8**
SWR	**< 1,2**	**< 1,2**	**< 1,2**	**< 1,2**
Dimensions (HxWxD), mm	**90 x 55 x 100**	**90 x 55 x 140**	**90 x 55 x 100**	**90 x 55 x 140**
Weight, kg	**0,3**	**0,5**	**0,6**	**0,9**

	FI-U1-L	FI-U2-L	FI-U1-H	FI-U2-H
FI ferrite isolator **x** frequency range (U=UHF) **x** isolator type (1=single, 2=dual) **x** input power (L=50W, H=100W)	**UHF low power single ferrite isolator**	**UHF low power dual ferrite isolator**	**UHF high power single ferrite isolator**	**UHF high power dual ferrite isolator**
Frequency range, MHz	**400 – 470**	**400 – 470**	**400 – 470**	**400 – 470**
Max input power, W	**50**	**50**	**100**	**100**
Isolation, dB	**> 30**	**> 60**	**> 30**	**> 60**
Insertion losses, dB	**< 0,4**	**< 0,8**	**< 0,4**	**< 0,8**
SWR	**< 1,2**	**< 1,2**	**< 1,2**	**< 1,2**
Dimensions (HxWxD), mm	**90 x 55 x 100**	**90 x 55 x 140**	**90 x 55 x 100**	**90 x 55 x 140**
Weight, kg	**0,3**	**0,5**	**0,6**	**0,9**