Hörwin

ANTENNA-FEEDER EQUIPMENT FOR
RADIO COMMUNICATION SYSTEMS

2018

WHO WE ARE

Vision

We are always on top
in creation passive devices for radio channel.
Stable, secured and constant radio connection
through strong and reliable equipment's.

Mission:

To create technical solutions effectively and with high flexibility accordingly to customer demand for better construction of radio systems.

Integration of basic radio equipment's in modern fast-changing world of technologies

Key values:

- Stable and strong basic solutions
- Ability for transformation
- Professionalism
- Orientation to customer needs
- Flexibility
- Open mind
- Constant support of ideas

ANTENNAS

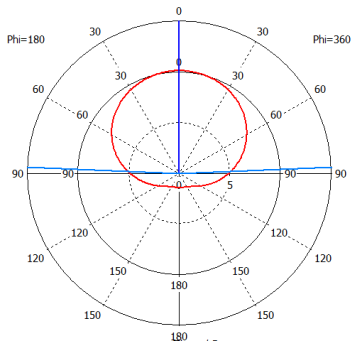
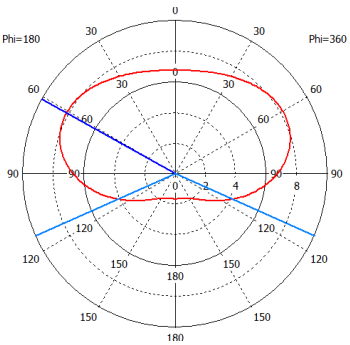
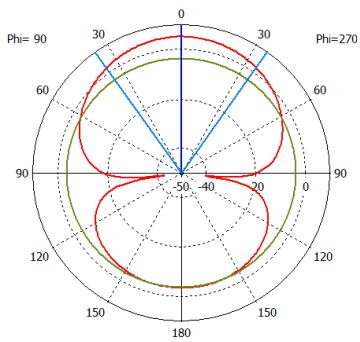
VHF/UHF FILTERS

VHF & UHF BASE STATION DUPLEXERS

ANTENNA AD1601

HORWIN AD 1601 is a one-dipole element array wide band VHF antenna for professional radio systems. Dipole incorporates “balun” matching circuit optimized for wide bandwidth and accurate matching. The horizontal radiation pattern is adjusted by changing the distance between dipole element and supporting mast. All antenna parts are made of aluminium and covered with 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. All components of dipole element are DCgrounded for better lighting and antistatic protection.

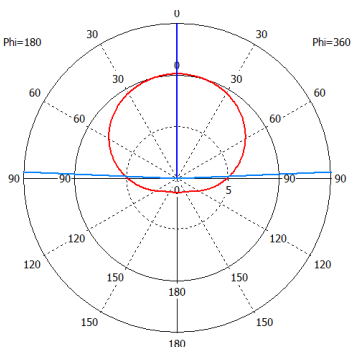
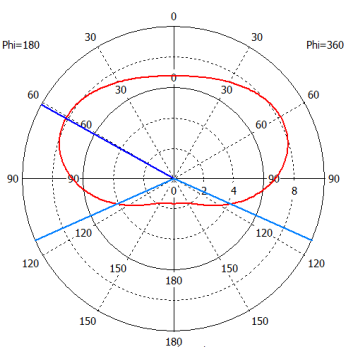
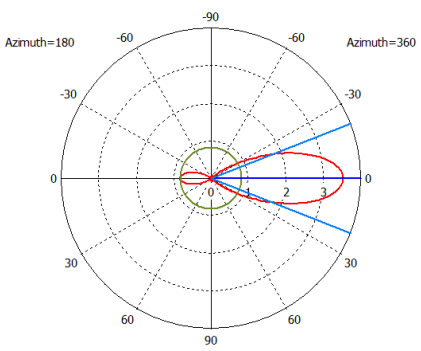
		AD1601
Frequency range, MHz		**136 – 176**
Bandwidth @ SWR < 1,5, MHz		**40**
Elements		**1**
Gain, dBd (1/4 λ dipole to mast spacing)		**0**
Gain, dBd (3/8 λ dipole to mast spacing)		**3**
Power rating, W		**200**
Overall dimensions, mm	H	**900**
	D	**1100**
Weight (aprox.), kg		**2,8**
Impedance, Ohm		**50**
Termination		**N- female**
Vertical beamwidth (3/8 spacing)		**70°**
Max. exposed area, m^2		**0,07**
Lateral thrust at 45 m/s, H		**80**
Lightning protection		**CD Ground**
Rated wind velocity, m/s		**45**
Rated wind velocity with 0.5" icing, m/s		**28**

E-plane ¼ λ dipole to mast spacing	E-plane 3/8 λ dipole to mast spacing	H-plene (Horwin AD 1601)
		

ANTENNA AD1602

HORWIN AD 1602 is a two-dipole element array wide band VHF antenna for professional radio systems.
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 aluminium and covered with 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. All components of dipole elements are DCgrounded for better lighting and antistatic protection.

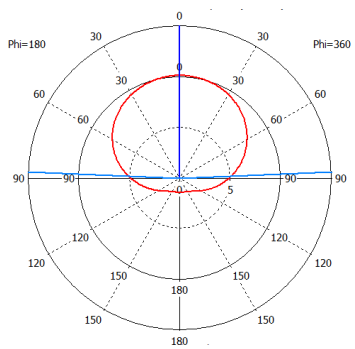
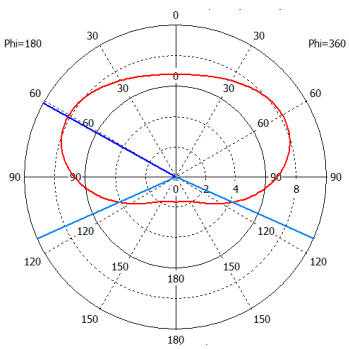
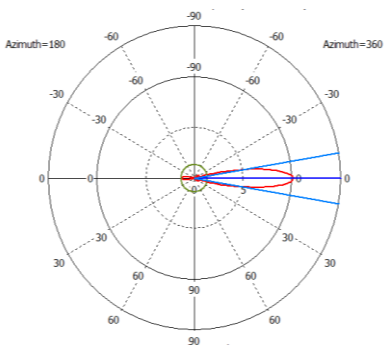
		AD1602
Frequency range, MHz		**136 – 176**
Bandwidth @ SWR < 1,5, MHz		**40**
Elements		**2**
Gain, dBd (1/4 λ dipole to mast spacing)		**3**
Gain, dBd (3/8 λ dipole to mast spacing)		**5,6**
Power rating, W		**200**
Overall dimensions, mm	H	**2200**
5/8λ spacing	D	**1100**
Weight (aprox.), kg		**5,9**
Impedance, Ohm		**50**
Termination		**N- female**
Vertical beamwidth (3/8 spacing)		**38°**
Max. exposed area, m^2		**0,14**
Lateral thrust at 45 m/s, H		**165**
Lightning protection		**CD Ground**
Rated wind velocity, m/s		**45**
Rated wind velocity with 0.5" icing, m/s		**28**

E-plane ¼ λ dipole to mast spacing	E-plane 3/8 λ dipole to mast spacing	H-plene (Horwin AD 1602)
		

ANTENNA AD 1604

HORWIN AD 1604 is a four-dipole element array wide band VHF antenna for professional radio systems.
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 aluminium and covered with 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. All components of dipole elements are DCgrounded for better lighting and antistatic protection.

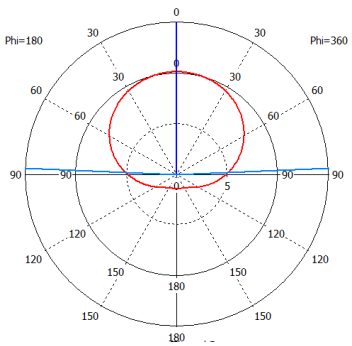
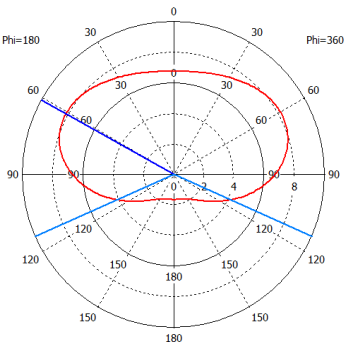
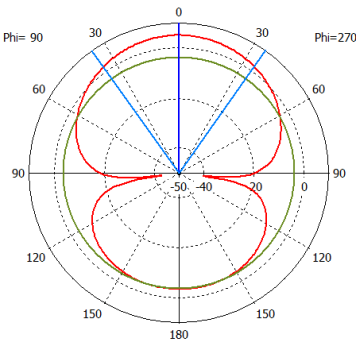
		AD1604
Frequency range, MHz		**136 – 176**
Bandwidth @ SWR < 1,5, MHz		**40**
Elements		**4**
Gain, dBd (1/4 λ dipole to mast spacing)		**6**
Gain, dBd (3/8 λ dipole to mast spacing)		**9**
Power rating, W		**200**
Overall dimensions, mm	H	**4800**
5/8λ spacing	D	**1100**
Weight (aprox.), kg		**11,5**
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, H		**335**
Lightning protection		**CD Ground**
Rated wind velocity, m/s		**45**
Rated wind velocity with 0.5" icing, m/s		**28**

E-plane ¼ λ dipole to mast spacing	E-plane 3/8 λ dipole to mast spacing	H-plene (Horwin AD 1604)
		

ANTENNA AD 4501

HORWIN AD 4501 is a one-dipole element array wide band UHF antenna for professional radio systems. Dipole incorporates “balun” matching circuit optimized for wide bandwidth and accurate matching. The horizontal radiation pattern is adjusted by changing the distance between dipole element and supporting mast. All antenna parts are made of aluminium and covered with 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. All components of dipole element are DCgrounded for better lighting and antistatic protection

		AD4501
Frequency range, MHz		400 – 470
Bandwidth @ SWR < 1,5, MHz		70
Elements		1
Gain, dBd (1/4 λ dipole to mast spacing)		0
Gain, dBd (3/8 λ dipole to mast spacing)		3
Power rating, W		200
Overall dimensions, mm	H D	300 550
Weight (aprox.), kg		2
Impedance, Ohm		50
Termination		N- female
Vertical beamwidth (3/8 spacing)		70°
Max. exposed area, m^2		0,028
Lateral thrust at 45 m/s, H		32
Lightning protection		CD Ground
Rated wind velocity, m/s		55
Rated wind velocity with 0.5" icing, m/s		28

E-plane ¼ λ dipole to mast spacing	E-plane 3/8 λ dipole to mast spacing	H-plene (Horwin AD 4501)
		

ANTENNA AD 4502

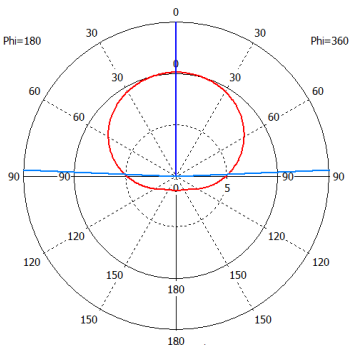
AD 4502 is a two-dipole element array wide band UHF antenna for professional radio systems.

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.

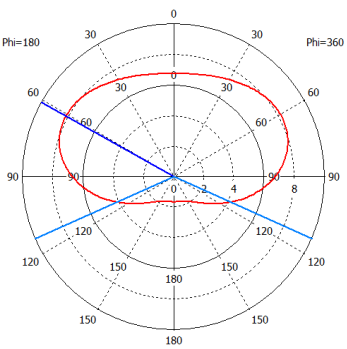
The horizontal radiation pattern is adjusted by changing the distance between dipole elements and supporting mast. All antenna parts are made of aluminium and covered with polymer powdered coating which resists water and ice buildup, and provides exceptional protection from corrosive gases, UV radiation, salt spray, acid rain and windblown abrasives. All components of dipole elements are DCgrounded for better lighting and antistatic protection.

		AD4502
Frequency range, MHz		**400 – 470**
Bandwidth @ SWR < 1,5, MHz		**70**
Elements		**2**
Gain, dBd (1/4 λ dipole to mast spacing)		**3**
Gain, dBd (3/8 λ dipole to mast spacing)		**5,6**
Power rating, W		**200**
Overall dimensions, mm	H	**800**
5/8λ spacing	D	**550**
Weight (aprox.), kg		**3,2**
Impedance, Ohm		**50**
Termination		**N- female**
Vertical beamwidth (3/8 spacing)		**37°**
Max. exposed area, m^2		**0,056**
Lateral thrust at 45 m/s, H		**64**
Lightning protection		**CD Ground**
Rated wind velocity, m/s		**55**
Rated wind velocity with 0.5" icing, m/s		**28**

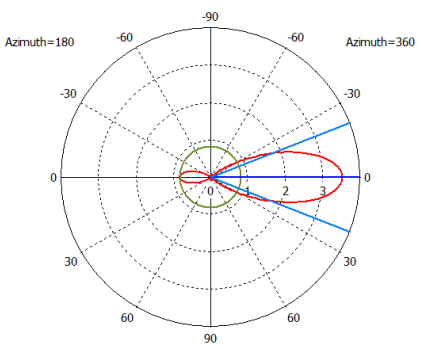
E-plane ¼ λ dipole to mast spacing



E-plane 3/8 λ dipole to mast spacing



H-plene (Horwin AD 4502)

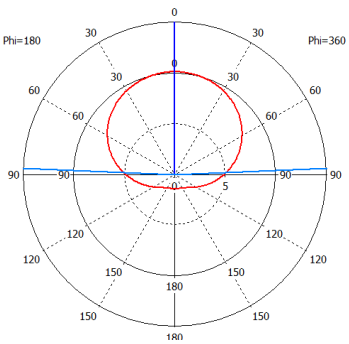


ANTENNA AD 4504

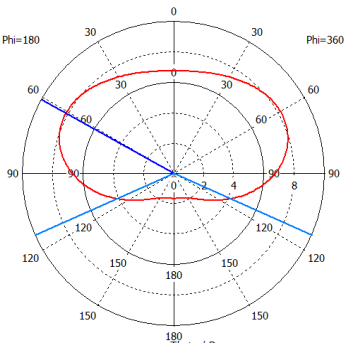
HORWIN AD 4504 is a four-dipole element array wide band UHF antenna for professional radio systems.
Dipole incorporates “balun” matching circuit optimized for wide bandwidth and accurate matching. More gain is achieved by coupling single folded dipoles into arrays. Dipoles in array are coupled by precision 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 aluminium and covered with 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. All components of dipole elements are DCgrounded for better lighting and antistatic protection.

		AD4504
Frequency range, MHz		**400 – 470**
Bandwidth @ SWR < 1,5, MHz		**70**
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	**2200**
5/8λ spacing	D	**550**
Weight (aprox.), kg		**7,2**
Impedance, Ohm		**50**
Termination		**N- female**
Vertical beamwidth (3/8 spacing)		**19°**
Max. exposed area, m^2		**0,112**
Lateral thrust at 45 m/s, H		**128**
Lightning protection		**CD Ground**
Rated wind velocity, m/s		**55**
Rated wind velocity with 0.5" icing, m/s		**28**

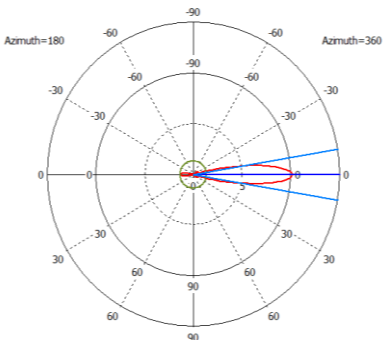
E-plane ¼ λ dipole to mast spacing



E-plane 3/8 λ dipole to mast spacing



H-plene (Horwin AD 4504)

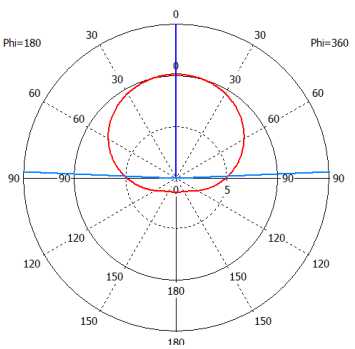


ANTENNA AD 4508

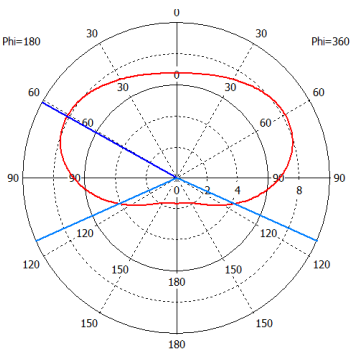
HORWIN AD 4508 is a eight-dipole element array wide band VHF antenna for professional radio systems.
Dipole incorporates “balun” matching circuit optimized for wide bandwidth and accurate matching. More gain is achieved by coupling single folded dipoles into arrays. Dipoles in array are coupled by precision 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 aluminium and covered with 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. All components of dipole elements are DCgrounded for better lighting and antistatic protection.

		AD4508
Frequency range, MHz		**400 – 470**
Bandwidth @ SWR < 1,5, MHz		**70**
Elements		**8**
Gain, dBd (1/4 λ dipole to mast spacing)		**9**
Gain, dBd (3/8 λ dipole to mast spacing)		**12**
Power rating, W		**200**
Overall dimensions, mm	H	**4600**
5/8λ spacing	D	**550**
Weight (aprox.), kg		**14,5**
Impedance, Ohm		**50**
Termination		**N- female**
Vertical beamwidth (3/8 spacing)		**9°**
Max. exposed area, m^2		**0,225**
Lateral thrust at 45 m/s, H		**256**
Lightning protection		**CD Ground**
Rated wind velocity, m/s		**55**
Rated wind velocity with 0.5" icing, m/s		**28**

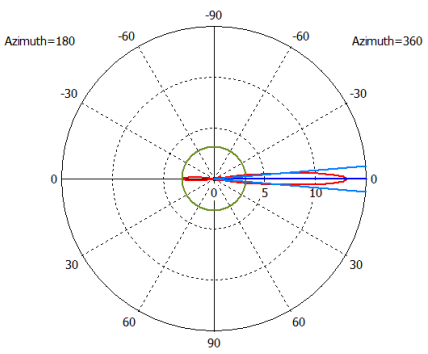
E-plane ¼ λ dipole to mast spacing



E-plane 3/8 λ dipole to mast spacing



H-plene (Horwin AD 4508)



ANTENNA AY 1603D

HORWIN AY1603D is a heavy duty 3 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.

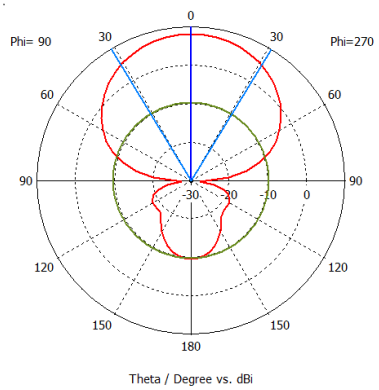
All components of antenna are DC- grounded for better lighting and antistatic protection. Antenna is made of galvanized aluminium and covered with polymer powdered coating. Boom material is 25 mm OD tube, driven element is 18 mm OD and passive elements are 8 mm OD tube. Elements are mounted to the boom 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).

	AY1603D
Elements	3
Frequency range, MHz	148 – 174
Bandwidth, MHz	26
SWR	< 1,5
Power rating, W	200
Gain, dBd	5.6
Front to Back ratio, dB	20
Beamwidth (H-plane)	105
Beamwidth (E-plane)	50
Nominal impedance, Ohm	50
Dimensions (HxL), мм	900 x 1000
Weight, kg	1,6

H-plene (Horwin AY 1603D)



ANTENNA AY 1605D

AY1605D is a heavy duty 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.

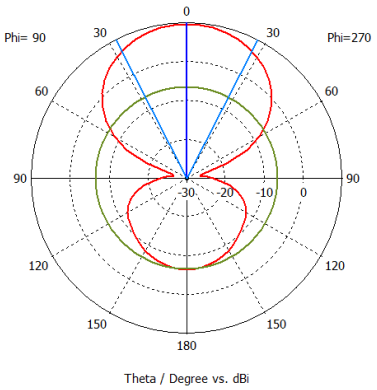
All components of antenna are DC- grounded for better lighting and antistatic protection. Antenna is made of galvanized aluminum and covered with polymer powdered coating. Boom material is 25 mm OD tube, driven element is 18 mm OD and passive elements are 8 mm OD tube. Elements are mounted to the boom with special aluminum 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).

	AY1605D
Elements	5
Frequency range, MHz	148 – 174
Bandwidth, MHz	26
SWR	< 1,5
Power rating, W	200
Gain, dBd	8
Front to Back ratio, dB	20
Beamwidth (H-plane)	48
Beamwidth (E-plane)	40
Nominal impedance, Ohm	50
Dimensions (HxL), мм	900 x 1500
Weight, kg	2,0

H-plene (Horwin AY 1605D)



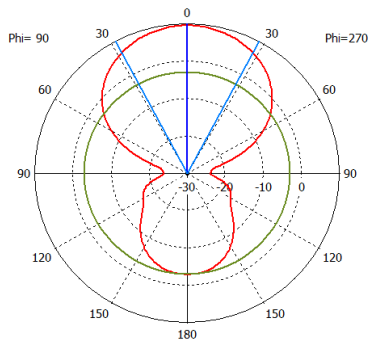
ANTENNA AY4505D

HORWIN AY4505D is a 5 elements wide bandwidth light weight directional antenna with folded dipole as drivenelement designed for various point to point as well as point / multipoint application. Folded driven element incorporates “balun” matching circuit optimized or wide bandwidth and accurate matching. All components of antenna are DC- grounded for better lighting and antistatic protection. Antenna is made of galvanized aluminum and covered with 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.

HORWIN AY4505D 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.

	AY4505D
Elements	5
Frequency range, MHz	403 – 470
Bandwidth, MHz	50
SWR	< 1,5
Power rating, W	100
Gain, dBd	5,6
Front to Back ratio, dB	22
Beamwidth (H-plane)	48
Beamwidth (E-plane)	42
Nominal impedance, Ohm	50
Dimensions (HxL), мм	395 x 700
Weight, kg	0,55

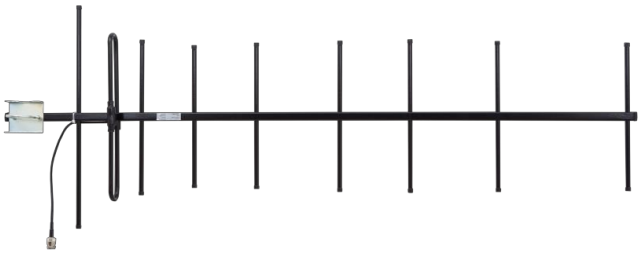
H-plene (Horwin AY 4505D)



ANTENNA AY4509D

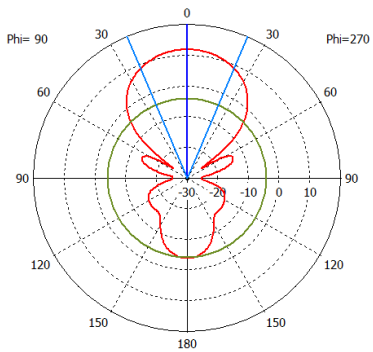
HORWIN AY4509D is a 9 elements wide bandwidth light weight directional antenna with folded dipole as drivenelement designed for various point to point as well as point / multipoint application. Folded driven element incorporates “balun” matching circuit optimized or wide bandwidth and accurate matching. All components of antenna are DC- grounded for better lighting and antistatic protection. Antenna is made of galvanized aluminum and covered with 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.

HORWIN AY4509D 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.



	AY4509D
Elements	**9**
Frequency range, MHz	**403 – 470**
Bandwidth, MHz	**50**
SWR	**< 1,5**
Power rating, W	**100**
Gain, dBd	**10**
Front to Back ratio, dB	**22**
Beamwidth (H-plane)	**40**
Beamwidth (E-plane)	**40**
Nominal impedance, Ohm	**50**
Dimensions (HxL), мм	**395 x 1080**
Weight, kg	**0,65**

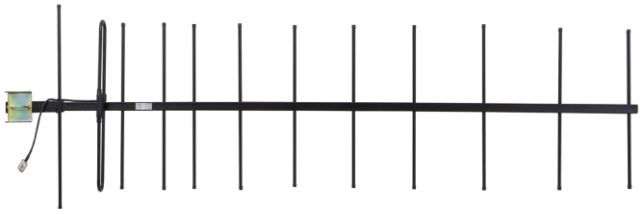
H-plene (Horwin AY 4509D)



ANTENNA AY45012D

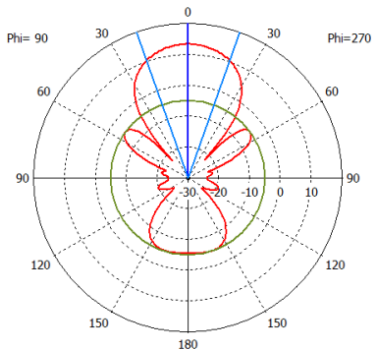
HORWIN AY45012D is a 12 elements wide bandwidth light weight directional antenna with folded dipole as drivenelement designed for various point to point as well as point / multipoint application. Folded driven element incorporates “balun” matching circuit optimized or wide bandwidth and accurate matching. All components of antenna are DC- grounded for better lighting and antistatic protection. Antenna is made of galvanized aluminum and covered with 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.

HORWIN AY45012D 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.



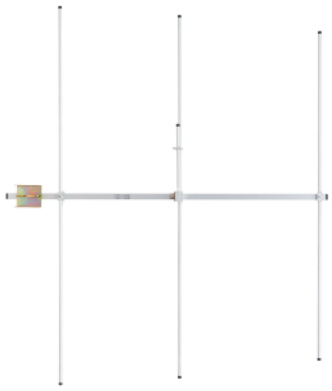
	AY45012D
Elements	12
Frequency range, MHz	403 – 470
Bandwidth, MHz	50
SWR	< 1,5
Power rating, W	100
Gain, dBd	12
Front to Back ratio, dB	20
Beamwidth (H-plane)	36
Beamwidth (E-plane)	30
Nominal impedance, Ohm	50
Dimensions (HxL), мм	395 x 1500
Weight, kg	1,05

H-plene (Horwin AY 45012D)



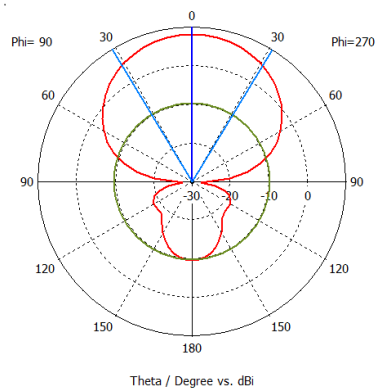
ANTENNA AY1603

HORWIN AY1603 is an inexpensive lightweight 3 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 aluminum with polymer covered. Boom material is 15 by 15 mm square tube and elements are 8 mm OD tube. Elements are mounted to the boom by special aluminum brackets through the boom with 6mm hex bolts.
AY1603 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 tuned to central frequency of customer specified range (< 8 MHz) or specified frequency.



	AY1603
Elements	**3**
Frequency range, MHz	**144 – 174**
Bandwidth, MHz	**8**
SWR	**< 1,5**
Power rating, W	**100**
Gain, dB	**5,6**
Front to Back ratio, dB	**20**
Beamwidth (H-plane)	**105°**
Beamwidth (E-plane)	**50°**
Nominal impedance, Ohm	**50**
Dimensions (H x L), mm	**900 x 1000**
Weight, kg	**0,65**

H-plene (Horwin AY 1603)



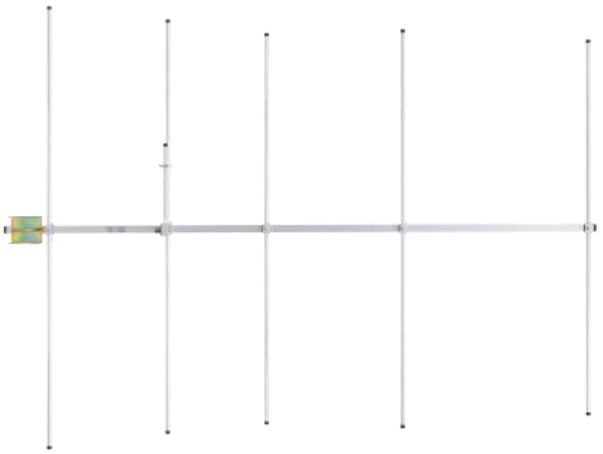
ANTENNA AY1605

HORWIM AY1605 is an inexpensive lightweight 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 aluminum with polymer covered. Boom material is 15 by 15 mm square tube and elements are 8 mm OD tube. Elements are mounted to the boom by special aluminum brackets through the boom with 6mm hex bolts.

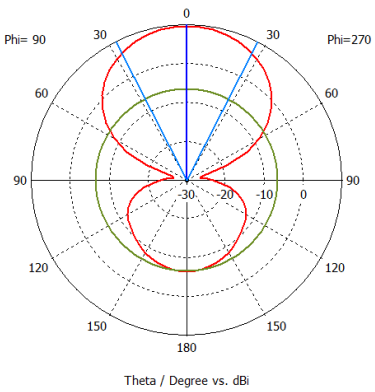
AY1605 includes mounting hardware — a U-bolt and special mounting bracket for rear mounting to the mast (30–40mm OD) for either vertical or horizontal polarization.

Antenna is tuned to central frequency of customer specified range (< 8 MHz) or specified frequency.



	AY1605
Elements	5
Frequency range, MHz	144 – 174
Bandwidth, MHz	8
SWR	< 1,5
Power rating, W	100
Gain, dB	8
Front to Back ratio, dB	20
Beamwidth (H-plane)	48°
Beamwidth (E-plane)	40°
Nominal impedance, Ohm	50
Dimensions (H x L), mm	900 x 1500
Weight, kg	0,85

H-plene (Horwin AY 1605)



Theta / Degree vs. dBi

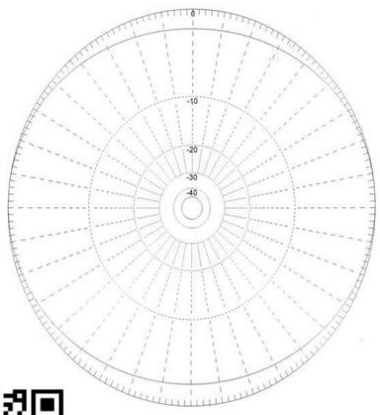
136-176 MHz

VHF RAIL/TRANSIT ANTENNA

HORWIN 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 on vehicles frequently exposed to damaging automatic washes.

	Railroad VHF Antenna	Transit VHF Antenna
Overall dimensions (H xLxD), 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	

E-plene



136-174 MHz

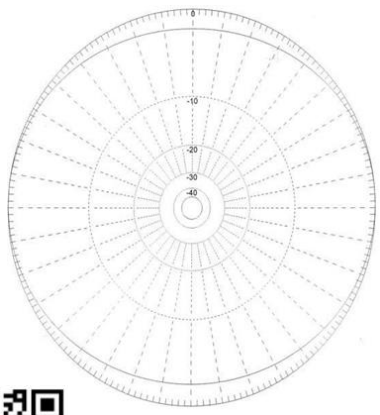
VHF «LOW PROFILE» ANTENNA

HORWIN «low profile» antennas is a folded quarter wave vertical antenna mostly used for VHF cab radios on rail and transit lines shunt locomotives. These rugged steel-made antennas are also an excellent solution to prevent vandalism destructions in high-risk areas and on 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).

	AR 160 LP
Overall dimensions (H xLxD), мм	**195 x 450 x 110**
Frequency range, MHz	**146 – 174**
Bandwidth, MHz	**12**
SWR	**< 1,5**
Nominal impedance, Ohms	**50**
Power rating, W	**200**
Weight, kg	**2,5**
Max wind speed, m/s	**< 120**

E-plene



ANTENNA AP868/915

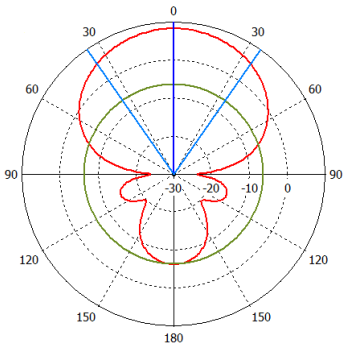
HORWIN AP868/915 panel directional antenna is designed for use in Low Power Wide Area Network (LoRaWAN) frequency range 868/915 MHz.

Body material — ABS plastic, resistant to ultraviolet radiation. Metal fasteners have a zinc coating. Mounting allows you to install the antenna on pipes with outer diameter up to 40 mm.

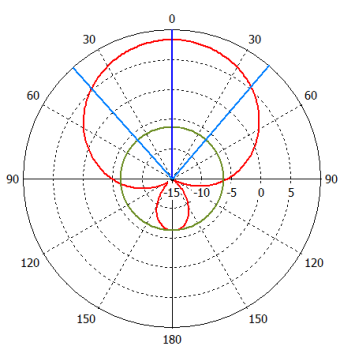
The connection to the radio frequency path is via the "SMA" or "RP-SMA" type connector. It is possible to install connectors of other types agreed upon when ordering the product.

	AP868/915
Frequency range, MHz	**863-870/902-928**
Polarization	**vertical**
SWR	**< 1,5**
Power rating, W	**50**
Gain, dBi	**8**
Front to Back ratio, dB	**> 15**
Beamwidth (H-plane)	**70**
Beamwidth (E-plane)	**82**
Nominal impedance, Ohm	**50**
Dimensions (HxLxD), мм	**175x160x150**
Weight, kg	**0,85**

E-plene (Horwin AP868/915)



H-plene (Horwin AP868/915)



ANTENNA AP1900M

HORWIN AP1900M panel directional MIMO antenna is designed for use with stationary subscriber devices of the LTE standards. Structurally, there are two independent orthogonal antennas placed in a common housing.

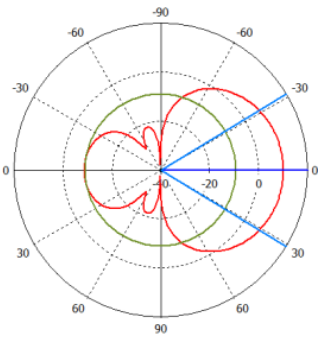
Optionally, a model is produced with an external compartment for the placement of active equipment.

Body material — ABS plastic, resistant to ultraviolet radiation. Metal fasteners have a zinc coating. Mounting allows you to install the antenna on pipes with outer diameter up to 40 mm.

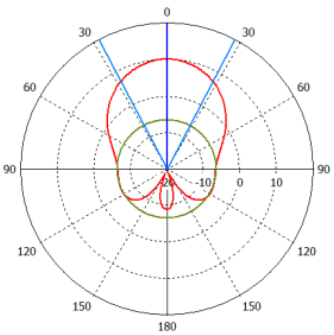
The connection to the radio frequency path is via the "SMA" or "RP-SMA" type connector.

	AP1900M
Frequency range LTE, MHz	**1700/1800/1900/2100/2600**
Polarization	**vertical**
SWR	**< 1,5**
Power rating, W	**50**
Gain, dBi	**10**
Front to Back ratio, dB	**> 19**
Beamwidth (H-plane)	**62**
Beamwidth (E-plane)	**55**
Nominal impedance, Ohm	**50**
Dimensions (HxLxD), mm	**160 x 160 x 155**
Weight, kg	**0,85**

E-plene (Horwin AP1900M)



H-plene (Horwin AP1900M)



ANTENNA AP1900V

HORWIN AP1900V panel directional antenna is designed for use with stationary subscriber devices of the UMTS, GSM 1800 standards.

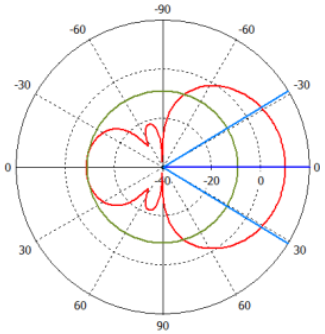
Optionally, a model is produced with an external compartment for the placement of active equipment.

Body material — ABS plastic, resistant to ultraviolet radiation. Metal fasteners have a zinc coating. Mounting allows you to install the antenna on pipes with outer diameter up to 40 mm.

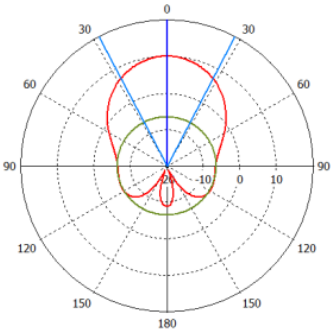
The connection to the radio frequency path is via the "SMA" or "RP-SMA" type connector. It is possible to install connectors of other types agreed upon when ordering the product.

	AP1900V
Frequency range, MHz	**1800/1900/2100**
Polarization	**vertical**
SWR	**< 1,5**
Power rating, W	**50**
Gain, dBi	**10**
Front to Back ratio, dB	**> 19**
Beamwidth (H-plane)	**62**
Beamwidth (E-plane)	**55**
Nominal impedance, Ohm	**50**
Dimensions (HxLxD), мм	**175x160x150**
Weight, kg	**0,85**

E-plene (Horwin AP1900V)



H-plene (Horwin AP1900V)



ANTENNA AJ-100

HORWIN VHF antenna AJ-100 is intended for use in the base radio stations in the frequency range 136 - 174 MHz. Constructively, the antenna is a vertical vibrator with the use of "J" similar reconciliation scheme. The declared parameters in the given range are provided by the control of geometrical and electrical parameters in the manufacture.

The antenna is intended for external use, and can be installed on masts, farms and other metal constructions. The mechanical structures on which the antenna is mounted must be grounded. The construction of the fastening assumes its installation to a vertical rod (pipe-resistant) or a mast with a diameter of up to 55 mm. In order to prevent distortion of the directivity chart, metal objects should be kept at a distance of less than 10 meters from the antenna elements.

UHF-type “female” connectors are used for connections.

	AJ100
Frequency range, MHz	**136-174**
Bandwidth, MHz	**4**
SWR	**< 1,5**
Power rating, W	**200**
Gain, dBi	**3**
Direction	**circular**
Nominal impedance, Ohm	**50**
Dimensions (HxL), мм	**35x1500**
Weight, kg	**0,9**

ANTENNA AJ400

HORWIN VHF antenna AJ-400 is intended for use in the base radio stations in the frequency range 403 - 470 MHz. Constructively, the antenna is a vertical vibrator with the use of "J" similar reconciliation scheme. The declared parameters in the given range are provided by the control of geometrical and electrical parameters in the manufacture.

The antenna is intended for external use, and can be installed on masts, farms and other metal constructions. The mechanical structures on which the antenna is mounted must be grounded. The construction of the fastening assumes its installation to a vertical rod (pipe-resistant) or a mast with a diameter of up to 40 mm. In order to prevent distortion of the directivity chart, metal objects should be kept at a distance of less than 10 meters from the antenna elements.

N-type “female” connectors are used for connections.

	AJ400
Frequency range, MHz	**403-470**
Bandwidth, MHz	**15**
SWR	**< 1,5**
Power rating, W	**150**
Gain, dBi	**3**
Polarisation	**vertical**
Nominal impedance, Ohm	**50**
Dimensions (HxL), mm	**35x750**
Weight, kg	**0,5**

PASS-REJECT FILTER PRF-VM6-SL

Horwin PRF-VM6-SL is a compact “band pass – band reject” filters based on a 6 helically resonators. This filter 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 aluminum. All coaxial cables used are semi-rigid silver plated. Cables and connectors are with PTFE insulation.

Filters are covered with polymer powdered coating. Filters are tuned for customer specified pass/reject frequencies and no further adjustments should be required.

	PRF-VM6-SL
Cavity size, mm	**23 x 23**
Frequency range, MHz (exact frequencies should be specified when ordering)	**144 – 174**
Duplex frequency spacing, MHz	**3 – 15**
Max. continuous power input, W	**50**
Insertion loss, db	**< 2.5**
Reject attenuation, dB	**> 80**
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)	**30 x 155 x 220**
Weight, kg	**1**

PASS-REJECT FILTER PRF-UM6-L

Horwin PRF-UM6-L is a compact “band pass – band reject” filters based on a 6 full size quarter wavelength resonators. This filter 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 aluminum. All coaxial cables used are semi-rigid silver plated. Cables and connectors are with PTFE insulation.

Filters are covered with polymer powdered coating. Filters are tuned for customer specified pass/reject frequencies and no further adjustments should be required.

	PRF-UM6-L
Cavity size, mm	**23 x 23**
Frequency range, MHz (exact frequencies should be specified when ordering)	**400 – 470**
Duplex frequency spacing, MHz	**10**
Max. continuous power input, W	**50**
Insertion loss, db	**< 2.5**
Reject attenuation, dB	**> 85**
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)	**30 x 115 x 250**
Weight, kg	**1**

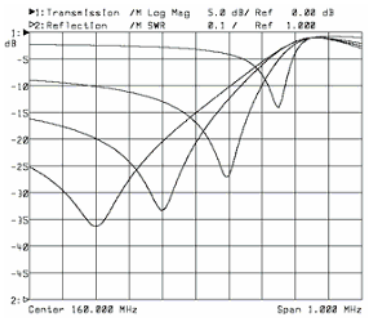
PASS-REJECT FILTER PRF-V1-5

Horwin PRF-V1-5 is a VHF “band pass – band reject” filters based on a quarter wave 5 inches width square single cavity. The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass or reject spacing.
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-V1-5
Cavity size		1/4λ, 5”
Frequency range, MHz		144 – 174
Max. continuous power input, W		200
Insertion losses, dB		0.5
ATT, dB @ pass-reject spacing		-38
Dimensions, mm (with tuningrodextended)	H	880
	D	130
	W	130
Weight, kg		2.7

S21



PASS-REJECT FILTER PRF-V2-5

Horwin PRF-V2-5 is a VHF “band pass – band reject” filters based on a quarter wave 5 inches width square dual 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. 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-V2-5
Cavity size		1/4λ, 5”
Frequency range, MHz		144 – 174
Max. continuous power input, W		200
Insertion losses, dB		1
ATT, dB @ pass-reject spacing		-75
Dimensions, mm (with tuningrodextended)	H	880
	D	130
	W	260
Weight, kg		5,5

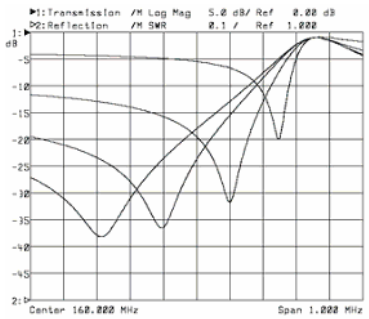
PASS-REJECT FILTER PRF-V1-8

Horwin PRF-V1-8 is a VHF “band pass – band reject” filters based on a quarter wave 8 inches width square single cavity. The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass or reject spacing.
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-V1-8
Cavity size		1/4λ, 8”
Frequency range, MHz		144 – 174
Max. continuous power input, W		200
Insertion losses, dB		0.5
ATT, dB @ pass-reject spacing		-40
Dimensions, mm (with tuningrodextended)	H	880
	D	210
	W	210
Weight, kg		3.5

S21



PASS-REJECT FILTER PRF-V2-8

Horwin PRF-V2-8 is a VHF “band pass – band reject” filters based on a quarter wave 8 inches width square dual 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. 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-V2-8
Cavity size		**1/4λ, 8”**
Frequency range, MHz		**144 – 174**
Max. continuous power input, W		**200**
Insertion losses, dB		**1**
ATT, dB @ pass-reject spacing		**-80**
Dimensions, mm (with tuningrodextended)	H D W	**880** **210** **420**
Weight, kg		**7,1**

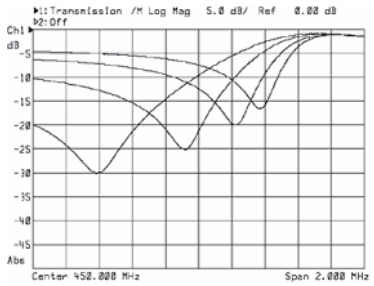
PASS-REJECTFILTER PRF-U1-5

Horwin PRF-U1-5 is a UHF “band pass – band reject” filters based on a quarter wave 5 inches width square single cavity. The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass or reject spacing.
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-U1-5
Cavity size		1/4λ, 5”
Frequency range, MHz		400 – 470
Max. continuous power input, W		200
Insertion losses, dB		0,5
ATT, dB @ pass-reject spacing		-25
Dimensions, mm (with tuningrodextended)	H D W	400 130 130
Weight, kg		1,5

S21



PASS-REJECTFILTER PRF-U2-5

Horwin PRF-U2-5 is a UHF “band pass – band reject” filters based on a quarter wave 5 inches width square dual 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. 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-U2-5
Cavity size		**1/4λ, 5”**
Frequency range, MHz		**400 – 470**
Max. continuous power input, W		**200**
Insertion losses, dB		**0,5**
ATT, dB @ pass-reject spacing		**-52**
Dimensions, mm (with tuningrodextended)	H	**400**
	D	**130**
	W	**130**
Weight, kg		**3,1**

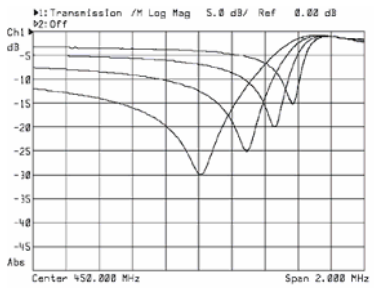
PASS-REJECTFILTER PRF-U1-8

Horwin PRF-U1-8 is a UHF “band pass – band reject” filters based on a quarter wave 8 inches width square single cavity. The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass or reject spacing.
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-U1-8
Cavity size		**1/4λ, 8”**
Frequency range, MHz		**400 – 470**
Max. continuous power input, W		**200**
Insertion losses, dB		**0,5**
ATT, dB @ pass-reject spacing		**-30**
Dimensions, mm (with tuningrodextended)	H D W	**400** **130** **130**
Weight, kg		**2**

S21



PASS-REJECTFILTER PRF-U2-8

Horwin PRF-U2-8 is a UHF “band pass – band reject” filters based on a quarter wave 8 inches width square dual 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. 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-U2-8
Cavity size		1/4λ, 8”
Frequency range, MHz		400 – 470
Max. continuous power input, W		200
Insertion losses, dB		0,5
ATT, dB @ pass-reject spacing		-68
Dimensions, mm (with tuningrodextended)	H D W	400 130 130
Weight, kg		4,1

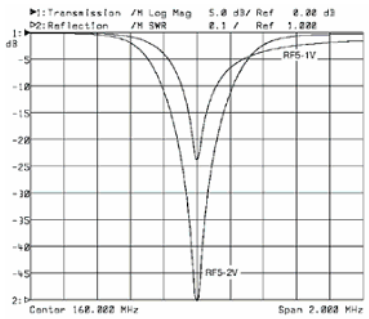
REJECT FILTER RF-V1-5

Horwin RF-V1-5 is a VHF reject (notch) filters based on a quarter wave 5 inches width square single cavity.
The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass or reject spacing.
Filter nominal impedance is 50 Ohms. N-type “female” connectors are used for input/output connections.

Cavities are aluminum 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-V1-5
Cavity size		**1/4λ, 5”**
Frequency range, MHz		**144 – 174**
Max. continuous power input, W		**200**
ATT, dB @ notch frequency		**17**
Dimensions, mm	H	**880**
(with tuning rod extended)	W	**130**
(with tuning rod extended)	L	**130**
Weight, kg		**2.7**

S21



REJECT FILTER RF-V2-5

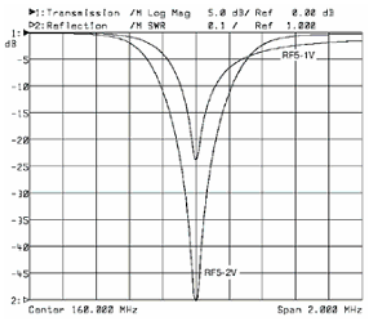
. Horwin RF-V2-5 is a VHF reject (notch) filters based on a quarter wave 5 inches width square dual cavities. The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass or reject spacing.

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 aluminum 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-V2-5
Cavity size		1/4λ, 5”
Frequency range, MHz		144 – 174
Max. continuous power input, W		200
ATT, dB @ notch frequency		45
Dimensions, mm	H	880
(with tuning rod extended)	W	130
(with tuning rod extended)	L	260
Weight, kg		5.5

S21



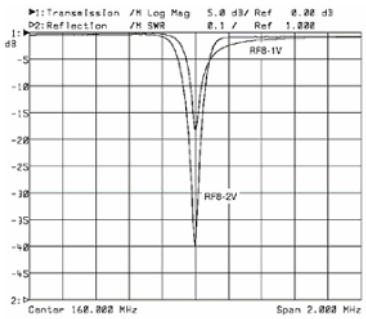
REJECT FILTER RF-V1-8

. Horwin RF-V1-8 is a VHF reject (notch) filters based on a quarter wave 8 inches width square single cavity.
The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass or reject spacing.
Filter nominal impedance is 50 Ohms. N-type “female” connectors are used for input/output connections.

Cavities are aluminum 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-V1-8
Cavity size		1/4λ, 8”
Frequency range, MHz		144 – 174
Max. continuous power input, W		200
ATT, dB @ notch frequency		19
Dimensions, mm	H	880
(with tuning rod extended)	W	210
	L	210
Weight, kg		3.5

S21



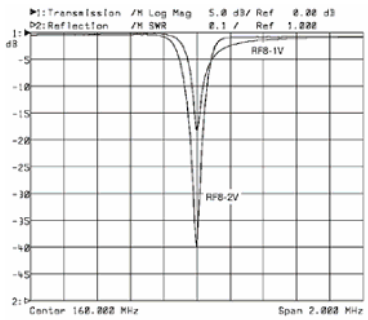
REJECT FILTER RF-V2-8

. Horwin RF-V2-8 is a VHF reject (notch) filters based on a quarter wave 8 inches width square dual 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.
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 aluminum 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-V2-8
Cavity size		1/4λ, 8”
Frequency range, MHz		144 – 174
Max. continuous power input, W		200
ATT, dB @ notch frequency		50
Dimensions, mm (with tuning rod extended)	H	880
	W	210
	L	420
Weight, kg		7.1

S21



REJECT FILTER RF-U1-5

Horwin RF-U1-5 is a UHF reject (notch) filters based on a quarter wave 5 inches width square single cavity.
The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass or reject spacing.
Filter nominal impedance is 50 Ohms. N-type “female” connectors are used for input/output connections.

Cavities are aluminum 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-U1-5
Cavity size		1/4λ, 5”
Frequency range, MHz		400 – 470
Max. continuous power input, W		200
ATT, dB @ notch frequency		20
Dimensions, mm	H	400
(with tuning rod extended)	W	130
	L	130
Weight, kg		1.5

REJECT FILTER RF-U2-5

. Horwin RF-U2-5 is a UHF reject (notch) filters based on a quarter wave 5 inches width square dual 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.
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 aluminum 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-U2-5
Cavity size		1/4λ, 5”
Frequency range, MHz		400 – 470
Max. continuous power input, W		200
ATT, dB @ notch frequency		47
Dimensions, mm	H	400
(with tuning rod extended)	W	130
	L	260
Weight, kg		3.1

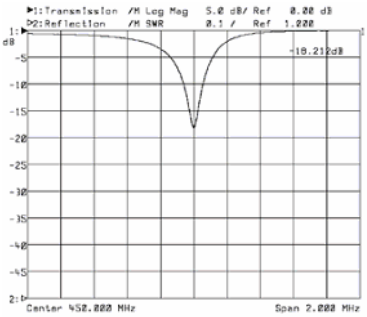
REJECT FILTER RF-U1-8

Horwin RF-U1-8 is a UHF reject (notch) filters based on a quarter wave 8 inches width square single cavity.
The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass or reject spacing.
Filter nominal impedance is 50 Ohms. N-type “female” connectors are used for input/output connections.

Cavities are aluminum 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-U1-8
Cavity size		1/4λ, 8”
Frequency range, MHz		400 – 470
Max. continuous power input, W		200
ATT, dB @ notch frequency		17
Dimensions, m (with tuning rod extended)	H W L	400 210 210
Weight, kg		2

S21



400-470 MHz

REJECT FILTER RF-U2-8

. Horwin RF-U2-8 is a UHF reject (notch) filters based on a quarter wave 8 inches width square dual 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.
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 aluminum 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-U2-8
Cavity size		1/4λ, 8”
Frequency range, MHz		400 – 470
Max. continuous power input, W		200
ATT, dB @ notch frequency		55
Dimensions, mm	H	400
(with tuning rod extended)	W	210
	L	420
Weight, kg		4.1

PASS FILTER PF-V1-5

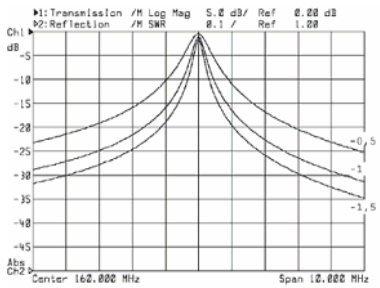
. Horwin PF-V1-5 is a VHF “band pass” filters based on a quarter length 5 inches width square single cavity. The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass band.

Filter nominal impedance is 50 Ohms. N-type “female” connectors are used for input/output connections.

Cavities are aluminum 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-V1-5
Cavity size		1/4λ, 5”
Frequency range, MHz		144 – 174
Max. continuous power input, W		200
Cavities numbers		1
ATT, dB/offset, Mhz		
(0.5dB insertion losses on central F)		-20/3
(2.0dB insertion losseson central F)		-27/3
(2.5dB insertion losseson central F)		-30/3
Dimensions, mm (with tuning rod extended)	H	850
	W	130
	L	130
Weight, kg		2.7

S21



PASS FILTER PF-V2-5

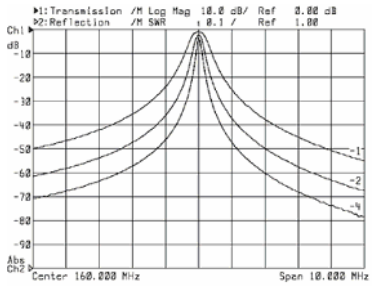
. Horwin PF-V2-5 is a VHF “band pass” filters based on a quarter wave 5 inches width square dual cavities. . The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass band.

Filter nominal impedance is 50 Ohms. N-type “female” connectors are used for input/output connections.

Cavities are aluminum 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-V2-5
Cavity size		1/4λ, 5”
Frequency range, MHz		144 – 174
Max. continuous power input, W		200
Cavities numbers		2
ATT, dB/offset, Mhz		
(0.5dB insertion losses on central F)		-38/2
(2.0dB insertion losseson central F)		-50/2
(2.5dB insertion losseson central F)		-60/2
Dimensions, mm	H	850
(with tuning rod extended)	W	130
	L	260
Weight, kg		5.5

S21



PASS FILTER PF-V3-5

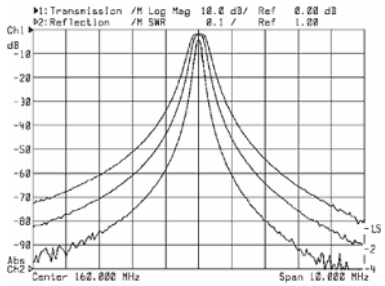
. Horwin PF-V3-5 is a VHF “band pass” filters based on a quarter wave 5 inches width square triplel cavities. The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass band.

Filter nominal impedance is 50 Ohms. N-type “female” connectors are used for input/output connections.

Cavities are aluminum 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-V3-5
Cavity size		1/4λ, 5”
Frequency range, MHz		144 – 174
Max. continuous power input, W		200
Cavities numbers		3
ATT, dB/offset, Mhz		
(0.5dB insertion losses on central F)		-38/1
(2.0dB insertion losseson central F)		-48/1
(2.5dB insertion losseson central F)		-50/1
Dimensions, mm (with tuning rod extended)	H	850
	W	130
	L	390
Weight, kg		8.3

S21



PASS FILTER PF-V1-8

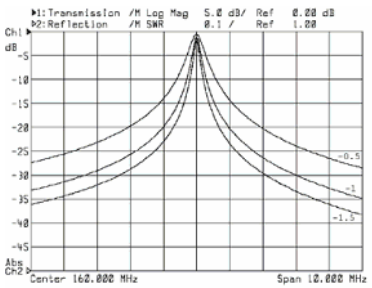
. Horwin PF-V1-8 is a VHF “band pass” filters based on a quarter length 8 inches width square single cavity. The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass band.

Filter nominal impedance is 50 Ohms. N-type “female” connectors are used for input/output connections.

Cavities are aluminum 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-V1-8
Cavity size		1/4λ, 8”
Frequency range, MHz		144 – 174
Max. continuous power input, W		200
Cavities numbers		1
ATT, dB/offset, Mhz		
(0.5dB insertion losses on central F)		-20/3
(2.0dB insertion losseson central F)		-30/3
(2.5dB insertion losseson central F)		37/3
Dimensions, mm	H	850
(with tuning rod extended)	W	130
	L	130
Weight, kg		3.5

S21



PASS FILTER PF-V2-8

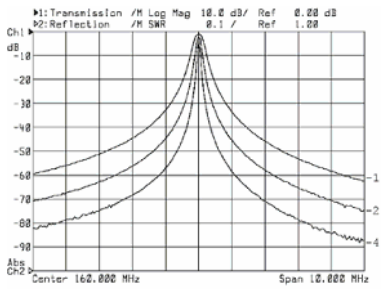
. Horwin PF-V2-8 is a VHF “band pass” filters based on a quarter wave 8 inches width square dual cavities. The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass band.

Filter nominal impedance is 50 Ohms. N-type “female” connectors are used for input/output connections.

Cavities are aluminum 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-V2-8
Cavity size		1/4λ, 8”
Frequency range, MHz		144 – 174
Max. continuous power input, W		200
Cavities numbers		2
ATT, dB/offset, Mhz		
(0.5dB insertion losses on central F)		-46/2
(2.0dB insertion losseson central F)		-58/2
(2.5dB insertion losseson central F)		-70/2
Dimensions, mm	H	850
(with tuning rod extended)	W	130
	L	260
Weight, kg		7.1

S21



PASS FILTER PF-V3-8

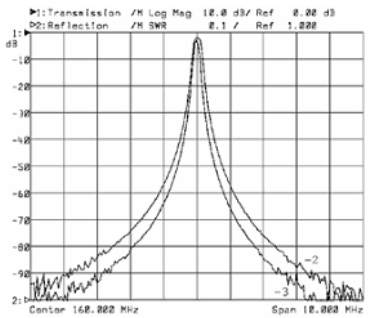
Horwin PF-V3-8 is a VHF “band pass” filters based on a quarter wave 8 inches width square triplel cavities. The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass band.

Filter nominal impedance is 50 Ohms. N-type “female” connectors are used for input/output connections.

Cavities are aluminum 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-V3-8
Cavity size		1/4λ, 8”
Frequency range, MHz		144 – 174
Max. continuous power input, W		200
Cavities numbers		3
ATT, dB/offset, Mhz		
(2.0dB insertion losseson central F)		-60/1
(2.5dB insertion losseson central F)		-66/1
Dimensions, mm (with tuning rod extended)	H	850
	W	130
	L	390
Weight, kg		10.7

S21



PASS FILTER PF-U1-5

Horwin PF-U1-5 is a UHF “band pass” filters based on a quarter length 5 inches width square single cavity. The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass band.

Filter nominal impedance is 50 Ohms. N-type “female” connectors are used for input/output connections.

Cavities are aluminum 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-U1-5
Cavity size		**1/4λ, 5”**
Frequency range, MHz		**400 – 470**
Max. continuous power input, W		**200**
Cavities numbers		**1**
ATT, dB/offset, Mhz		
(0.5dB insertion losses on central F)		**-20/3**
(2.0dB insertion losseson central F)		**-40/3**
(2.5dB insertion losseson central F)		**–**
Dimensions, mm	H	**850**
(with tuning rod extended)	W	**130**
	L	**130**
Weight, kg		**1.5**

PASS FILTER PF-U2-5

. Horwin PF-U2-5 is a UHF “band pass” filters based on a quarter wave 5 inches width square dual cavities. The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass band.

Filter nominal impedance is 50 Ohms. N-type “female” connectors are used for input/output connections.

Cavities are aluminum 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-U2-5
Cavity size		1/4λ, 5”
Frequency range, MHz		400 – 470
Max. continuous power input, W		200
Cavities numbers		2
ATT, dB/offset, Mhz		
(2.0dB insertion losseson central F)		-50/2
(2.5dB insertion losseson central F)		-60/2
Dimensions, mm	H	850
(with tuning rod extended)	W	130
	L	260
Weight, kg		3.1

PASS FILTER PF-U3-5

. Horwin PF-U3-5 is a UHF “band pass” filters based on a quarter wave 5 inches width square triplel cavities. The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass band.

Filter nominal impedance is 50 Ohms. N-type “female” connectors are used for input/output connections.

Cavities are aluminum 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-U3-5
Cavity size		1/4λ, 5”
Frequency range, MHz		400 – 470
Max. continuous power input, W		200
Cavities numbers		3
ATT, dB/offset, Mhz		
(2.0dB insertion losseson central F)		-50/1
(2.5dB insertion losseson central F)		-55/1
Dimensions, mm	H	850
(with tuning rod extended)	W	130
	L	390
Weight, kg		4.7

PASS FILTER PF-U1-8

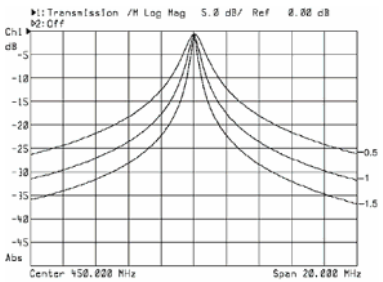
. Horwin PF-U1-8 is a UHF “band pass” filters based on a quarter length 8 inches width square single cavity. The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass band.

Filter nominal impedance is 50 Ohms. N-type “female” connectors are used for input/output connections.

Cavities are aluminum 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-U1-8
Cavity size		1/4λ, 8”
Frequency range, MHz		400 – 470
Max. continuous power input, W		200
Cavities numbers		1
ATT, dB/offset, Mhz		
(0.5dB insertion losses on central F)		-15/3
(1.0dB insertion losseson central F)		-22/3
(1.5dB insertion losseson central F)		-28/3
Dimensions, mm	H	850
(with tuning rod extended)	W	130
	L	130
Weight, kg		3

S21



PASS FILTER PF-U2-8

Horwin PF-U2-8 is a UHF “band pass” filters based on a quarter wave 8 inches width square dual cavities. The use of large cavities provides a high input power rating and means high Q, resulting in a very narrow pass band.

Filter nominal impedance is 50 Ohms. N-type “female” connectors are used for input/output connections.

Cavities are aluminum 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.

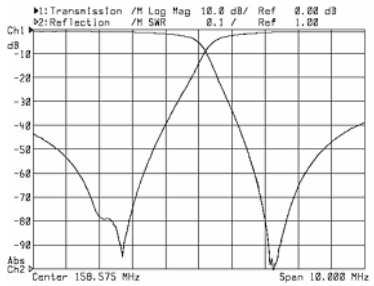
		PF-U2-8
Cavity size		1/4λ, 8”
Frequency range, MHz		400 – 470
Max. continuous power input, W		200
Cavities numbers		2
ATT, dB/offset, Mhz		
(2.0dB insertion losseson central F)		-50/2
(2.5dB insertion losseson central F)		-60/2
Dimensions, mm	H	850
(with tuning rod extended)	W	130
	L	260
Weight, kg		4.1

BASE STATION DUPLEXER DF-VM6-H

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
Cavity size, mm	40 x 40
Frequency range, MHz	136 – 176
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	5

S21

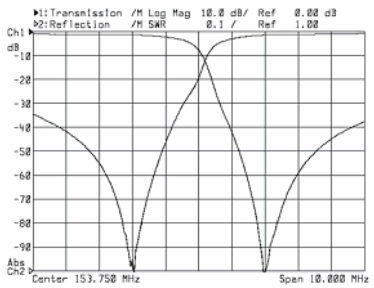


BASE STATION DUPLEXER DF-VM6-SL

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-SL
Cavity size, mm	23 x 23
Frequency range, MHz	144 – 174
Duplex frequency spacing, MHz	4 – 24
Max. continuous power input, W	50
Insertion loss, db	< 1.4
Tx noise suppression on Rx frequency, dB	80
Rx isolation on Tx frequency, dB	> 80
Tx noise suppression on Rx (multichannel), dB	> 60 (1.5 MHz BW)
Rx isolation on Tx (multichannel), dB	> 60 (1.5 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)	30 x 155 x 220
Weight, kg	1

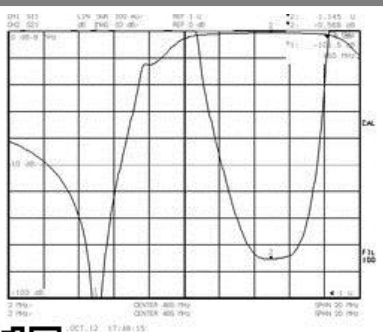
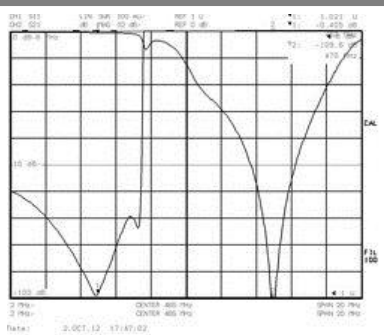
S21



UHF BASE STATION DUPLEXER DF-UM6-H

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-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 onfrequencies ordered)	55 x 252 x 274
Weight, kg	2.5

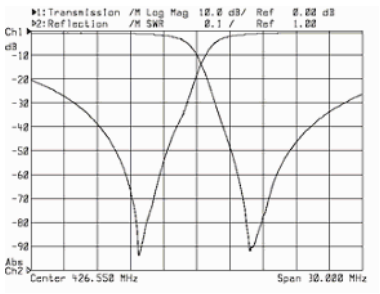
S11, S21 high	S11, S21 low
	

BASE STATION DUPLEXER DF-UM6-L

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-UM6-L
Cavity size, mm	23 x 23
Frequency range, MHz	400 – 470
Duplex frequency spacing, MHz	4 – 15
Max. continuous power input, W	50
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)	30 x 155 x 250
Weight, kg	1

S21



BASE STATION DUPLEXER DF-V4-5

·Horwin DF-V/-x-5 series is a “Band pass/reject” type VHF 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 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**
Cavity size	**1/4λ, 5”**	**1/4λ, 5”**
Frequency range, MHz	**144 – 174**	**144 – 174**
Min. duplex frequency spacing, kHz	**600**	**400**
Max. continuous power input, W	**150**	**150**
Insertion loss, db	**< 1.5**	**< 2**
Tx noise suppression on Rx frequency, dB	**> 75**	**> 85**
Rx isolation on Tx frequency, dB	**> 80**	**> 80**
Nominal impedance, Ohm	**50**	**50**
VSWR	**< 1.5**	**< 1.5**
Connectors type	**N-female**	**N-female**
Temperature range, °C	**–30 … +60**	**–30 … +60**
Dimensions (HxWxD), mm (with rod extended)	**880x260x260**	**880x390x260**
Weight, kg	**9.5**	**13.5**

BASE STATION DUPLEXER DF-U4-5

Horwin DF-U-x-5 series is a “Band pass/reject” type UHF 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-U4-5	DF-U6-5
DF duplex filter **x** frequency range (V=VHF, U=UHF) **x** cavities numbers **x** cavity width (inches)	**4 cavities UHF duplex filter**	**6 cavities UHF duplex filter**
Cavity size	**1/4λ, 5”**	**1/4λ, 5”**
Frequency range, MHz	**400 – 470**	**400 – 470**
Min. duplex frequency spacing, kHz	**2000**	**1500**
Max. continuous power input, W	**150**	**150**
Insertion loss, db	**< 1.5**	**< 2**
Tx noise suppression on Rx frequency, dB	**> 75**	**> 85**
Rx isolation on Tx frequency, dB	**> 85**	**> 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 (HxWxD), mm (with rod extended)	**400x260x260**	**400x390x260**
Weight, kg	**6.5**	**8.8**

VHF HYBRID TRANSMITTER COMBINERS

Horwin CH-Vx-x series is a VHF hybrid combiners with ferrite isolators used for combining several VHF 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 x x x x	Combiner (hybrid) frequency range (V=VHF) Tx Channels isolator type (1=single, 2=dual) input power (L=50W, H=100W)	CH-V2-1L(H) 2 channels VHF hybrid combiner with single isolator	CH-V2-2L(H) 2 channels VHF hybrid combiner with dual isolator	CH-V4-1L(H) 4 channels VHF hybrid combiner with single isolator	CH-V4-2L(H) 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

UHF HYBRID TRANSMITTER COMBINERS

Horwin CH-Ux-x series is a UHF hybrid combiners with ferrite isolators used for combining several 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-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**

VHF 8” CAVITY TRANSMITTER COMBINERS

Horwin CB8-Vx-x series is low insertion loss combiners with ferrite isolators used for combining several transmitters into one antenna with up to 125 kHz (VHF) 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

UHF 8” CAVITY TRANSMITTER COMBINERS

Horwin CB8-Ux-x series is low insertion loss combiners with ferrite isolators used for combining several transmitters into one antenna with up to 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-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 FERRITE ISOLATORS

Horwin FI-Vx-x series is a ferrite isolators used for protection and isolation of VHF 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**

UHF FERRITE ISOLATORS

Horwin FI-Ux-x series is a ferrite isolators used for protection and isolation of 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-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**